2012

# PSYCHOMETRIC EVALUATIONS OF AN ACCULTURATION SCALE AND AN ACCULTURATION STRESS SCALE WITH AMERICAN INDIAN UNIVERSITY STUDENTS

Michael Brian Trahan

# PSYCHOMETRIC EVALUATIONS OF AN ACCULTURATION SCALE AND AN ACCULTURATION STRESS SCALE WITH AMERICAN INDIAN UNIVERSITY STUDENTS

by

Michael Brian Trahan

Bachelor of Arts, Jamestown College, Jamestown, ND, 1998
Master of Arts, The University of Montana, Missoula, MT, 2007

Dissertation

presented in partial fulfillment of the requirements
for the degree of

Doctor of Philosophy
in Psychology, Clinical

The University of Montana
Missoula, MT

July 2012

Approved by:

Sandy Ross, Dean of The Graduate School
Graduate School

Gyda Swaney, Co-Chair
Psychology

Daniel Denis, Co-Chair
Psychology

Tom Seekins
Psychology

Bryan Cochran
Psychology

George Price
Native American Studies & History
African American Studies Program

Trahan, Michael, Ph.D., July 2012 Clinical Psychology

Psychometric Evaluations of an Acculturation Scale and an Acculturation Stress Scale with American Indian University Students

Co-Chairperson: Gyda Swaney, Ph.D.

Co-Chairperson: Daniel Denis, Ph.D.

Acculturation and acculturation stress are constructs studied with various minority groups. This study tests the factor loadings for both the Native American Acculturation Scale (N.A.A.S.) and the Social, Attitudinal, Familial, and Environmental Acculturation Stress Scale (S.A.F.E.), as well as the reliability of these measures with American Indian undergraduate and graduate students in a university setting. The first hypothesis was that the factor loadings of the N.A.A.S. with this sample would not resemble the original factor structure found by Garrett and Pichette (2000). It was also believed that the N.A.A.S. would exhibit robust reliability with this sample, based upon a previous, unpublished study by this author. The second hypothesis was that the factor loadings of the S.A.F.E. scale with this sample would not approximate the original factor loadings by Mena, Padilla, and Maldonaldo (1987). It was also believed that the S.A.F.E. would exhibit robust reliability with this sample. The final hypothesis was that a significant, negative correlation would exist between the N.A.A.S. and the S.A.F.E. Factor loadings were found utilizing exploratory factor analysis with promax rotation. The results showed that both measures loaded differently with this sample. A significant, negative relationship was also found for the N.A.A.S. and the S.A.F.E., in which lower scores attained on the N.A.A.S. were associated with higher scores on the S.A.F.E. scale. Participants who scored lower on the N.A.A.S. (low acculturation), reported higher levels of acculturative stress on the S.A.F.E. scale. Limitations and future directions are discussed.

*Keywords:* acculturation, acculturation stress, American Indian, exploratory factor analysis, reliability, university students, N.A.A.S., S.A.F.E.

**Acknowledgements**

I would like to thank my wife, Cathy, and our children, Mason, Connor, and Mylie, for their love, support, and patience with my educational endeavor. This would not have been possible without our sacrifices. I would also like to thank especially my parents and my extended family for encouraging me and supporting us in many different ways throughout this rewarding process.

I would also like to thank my co-advisors, Dr. Swaney and Dr. Denis, for giving me the opportunity to grow from my successes as well as my failures.

I would also like to thank my committee: Dr. Cochran, Dr. Seekins, and Dr. Price, for their valuable insights and support throughout this project. Your continued encouragement assisted me to complete my project. Lemlmtš (Thank you).

Michael B. Trahan, PhD
"Sne Ucu-cil-shem" (Elk Tracks)
Salish, Confederated Salish and Kootenai Tribes

**Psychometric Evaluations of an Acculturation Scale and an Acculturation Stress Scale with American Indian University Students**

## Acculturation

Many researchers have studied acculturation from various viewpoints, resulting in disparate and unique explanations. Some have examined the ethnic differences within the experiences of acculturation (Dona & Berry, 1994; Garrett & Pichette, 2000; Krishnan & Berry, 1992; Mendoza and Martinez, as cited by Mendoza, 1989; Pawliuk, Grizenko, Chan-Yip, Gantous, Mathew, & Nguyen, 1996; Trahan, 2007; Zheng & Berry, 1991). Other researchers have examined the gender differences involved in the experiences of acculturation (Kim, O'Neil, & Owen, 1996; Yu, 1984). For instance, Berry (as cited by Nwadiora & McAdoo, 1996), posited that acculturation was dependent upon the characteristics of both the minority and majority cultures. He also believed the characteristics of the individual affected the acculturation experiences with two or more cultures. If the individual's culture held similar beliefs and value systems with the dominant culture, less acculturation dissonance occurred. Garcia and Ahler (as cited by Garrett & Pichette, 2000) explained acculturation as the change within each individual that is the product of when two or more cultures are in consistent interaction with one another.

J.W. Berry (1980), a leading researcher in acculturation proposed four outcomes of the acculturation processes, based upon the fourfold theory of acculturation: assimilation, integration, rejection (i.e., marginalization), and deculturation. Assimilation pertained to an individual who chose the majority or alternate culture's beliefs and practices over their culture of origin. Integration was the process of the individual who chose the beliefs and practices of both the majority culture and the culture of origin

equally. The integrated individual was deemed successful when they navigated seamlessly between the two variant cultures. Rejection pertained to an individual who rejected both the majority culture's beliefs and practices and the beliefs and practices from their culture of origin. Finally, deculturation occurred when the individual defied against the beliefs and values of the dominant culture, stemming from feeling alienated by the dominant culture. Berry believed that individuals involved in an acculturation process would have determined the value of their native culture, the cost involved in retaining their culture, and the value/costs of possessing positive relations with the dominant culture. Berry's definitions of acculturation were the hallmark in acculturation theory and cited by numerous researchers who attempted examining the validity of the construct with various ethnic and cultural groups.

Berry (1980) also described three process modes of acculturation: the contact period, the conflict period, and the resolution period. The contact period was when the individual had contact with a differing culture. This period could be short or long in duration. The conflict period was when the individual felt external conflicts, stemming from pressures within both cultural groups, often encouraging individuals to adopt the practices of the culture. This process elicited confusion and stress relating to cultural preferences within the individual. Finally, the resolution period occurred when the individual reached a decision of cultural preference. Berry believed that once the individual chose their preference, one of the four categories of acculturation the individual exhibited (assimilation, integration, rejection, or deculturation).

Ward (2008) identified a related construct, based upon Berry's fourfold theory, which appeared to relate closely with acculturation stress, which she described as the

ethno-cultural identity conflict (EIC). She proposed that EIC was a new way to describe Berry's conceptualization of the acculturation process. She identified three ways to reconceptualize acculturation, or utilize EIC as an adjunct to Berry's acculturation model. The first was to provide theoretical evidence to the fourfold theory model using the construct of EIC. The second strategy introduced a novel construct: the motivation for ethno-cultural continuity (MEC), which delineated the differences between the individual and the overall group's motivations during the processes of acculturation. Lastly, she examined more short-term and voluntary acculturation processes (tourism) and the subsequent interactions and relationships between tourists and the hosts. Ward (2008) cited the works of Gezentsvey, in which she described three components of motivation for ethno-cultural continuity (MEC): maintenance, transmission, and endurance. Also inherent to the components of MEC were the orientations of self, family, or the group. She described the multiple processes in which the individual delineated the costs and benefits from the actions and motivations of adhering to their culture of origin. She described the processes of self, family, or group that could theoretically occur at the same time. For example, an individual may have an innate desire to maintain their ethno-cultural heritage, which is an orientation of the self. They also possessed a desire to teach their ethno-cultural beliefs and practices to their child(ren), or family-oriented motivation. The latter form of motivation provided the basis necessary to continue the practices, beliefs, and bloodlines of their culture, or group-oriented motivation.

Much discussion emerged concerning whether the process of acculturation was unidimensional, the basis of the fourfold theory, or a multidimensional construct. Proponents to the unidimensional or fourfold theory model described a finite amount of

resources available to the individual. Therefore, increased adherence to one culture theoretically led to a decrease in the practices and beliefs of the other culture. The fourfold theory of acculturation had been described as dimensional in nature and has attempted to explain acculturation in terms of four distinct processes whereby an individual has : a) assimilated completely to the majority culture; b) separated from the majority culture while adhering to their culture of origin; c) has integrated into both cultures; and d) marginalized and extricated him/herself from both cultures. Although the nomenclature differed between theories, Berry has been cited by researchers examining the fourfold model of acculturation.

Some theorists, however, have not believed Berry's conceptualization that acculturation was a linear process. Miller (2007) proposed that Berry's process of acculturation was bilinear, instead of a unilateral construct. Miller indicated that the fourfold model proposed instances in which the individual adhered to native cultural components, while acquiring dominant cultural components, without creating a functional deficit in either direction. This definition of the fourfold model appeared to illuminate the possibility that the concepts of the fourfold model had more in common with Oetting and Beauvais' (1990) orthogonal theory than was previously believed. Oetting and Beauvais (1990) supposed that the individual's choices of cultural affiliation were unrelated to one another. Therefore, no cultural deficit existed when the individual chose one cultural belief, practice, etc. For instance, an American Indian individual might affiliate with their American Indian culture and the majority culture at the same time, without compromising their overall cultural affiliation, as the affiliations of various cultural components were not correlated with one another.

In line with the concept of multidimensional acculturation, Berry (2009) contended that the process of acculturation and the subsequent acculturation strategies were experienced at the individual level, as well as in other dimensions. He maintained that acculturation was the process between an individual and the individual's ethnocultural group. It was also the interaction between the individual and the predominant society. He maintained that the individual reflected a "relative preference for maintaining one's heritage culture and identity and a relative preference for having contact with and participating in the larger society along with other ethnocultural groups" (p. 366). In essence, he was not stating that the individual's strategy was to acculturate to the dominant group, per se, but that the individual knew and preferred their culture of origin. He argued that the individual then developed strategies to maintain their culture of origin while interacting with other cultures and the larger society.

Some theorists described acculturation as an emic construct (culturally specific) because acculturation has included a member of a minority culture and represented their interactions with the majority culture. Garrett and Pichette (2000) identified five levels of acculturation for American Indians, based from Berry's original theory of acculturation: traditional, marginal, bicultural, assimilated, and pantraditional. They described a "traditional" person as an individual who may or may not have spoken English, may have thought in their Native way, and may have participated in practices of their culture of origin. They described a "marginal" person as an individual who may have spoken neither English nor their Native language well and had not accepted or participated in the practices of their culture of origin nor of the majority culture. A "bicultural" individual, according to them, was a person who may have spoken both

English and their Native languages, embraced and accepted both the majority and their native culture. They described an "assimilated" person as an individual who solely embraced the cultural beliefs and behaviors from the majority culture and not of their culture of origin. Finally, a "pantraditional" individual was described as an American Indian who had assimilated to the majority culture early in life. For various reasons, the person had made a conscious choice and effort to regain the beliefs and practices of their culture of origin later in life. They further explained that these individuals had lived by the majority culture's premises and were often accepted by the majority culture. Pantraditional individuals also sought the cultural values, beliefs, and practices of their tribal origins, which they previously had no contact, either voluntarily or involuntarily. These individuals might have been bilingual and have spoken both English and their Native language well. The pantraditional individual was different from the bicultural individual in that the pantraditional individual had previously rejected their native culture, whereas the bicultural individual had not. Garrett and Pichette (2000) developed an instrument, the Native American Acculturation Scale (N.A.A.S.), in an effort to measure the acculturation levels they had posited. This instrument will be described in more detail later in this paper.

Finley (1999) developed a measure similar to the N.A.A.S. and titled it the Native American Cultural Behaviors and Attitudes (N.A.C.B.A.). The N.A.C.B.A. is a 27-item scale that attempted to measure acculturation with American Indians. He based his scale upon the fourfold theory of acculturation, primarily following Berry's (1980) conceptualization. He psychometrically examined his measure, using factor analysis, to determine the appropriateness of his measure with American Indians. The N.A.C.B.A.

contained 17 items that measured behaviors and 10 items that measured attitudes associated with either the majority culture or the culture of origin.

Finley (1999) utilized factor analysis to determine the factor structure, internal consistency, and construct validity of the N.A.C.B.A. and found that both scales of the measure (behavioral and attitudes) were reliable for use in measuring acculturation with American Indians. He also discovered that the measure was appropriately measuring the construct of acculturation (construct validity).

Opponents of the fourfold model questioned the content and construct validity of the model (as content validity is paramount to ascertain construct validity (Haynes, Richard, & Kubany, 1995). Rudmin (2003) proposed that the factors involved in the fourfold model did not possess statistical independence from one another and the theory could be correct if it were measuring only one culture. The lack of independence between the factors, led to an overlap between the supposed categorically independent factors , diminishing the validity of the model. Rudmin (2003) also argued that researchers have over used the fourfold acculturation theory to examine ethnic minorities and the influence inflicted by the majority cultures. He maintained that these theorists had not considered a reciprocal interaction in which the minority culture also influenced the majority culture. He hinted that such an omission was an act of covert racism and that the omission implied that only the majority culture could exude an influence and not vice versa.

Rudmin (2003) argued against the fourfold theory due to the questionable statistical analyses utilized to describe variables that lacked independence from one another. He emphasized that factor analysis should not have been used to measure the

validity of this construct. He wrote that it was difficult to analyze the factors because a relationship, or correlation, existed between the acculturation categories (i.e., assimilation, integrated, marginal, separation). Following mathematical logic, Rudmin (2003) argued that if one viewed acculturation within a minority culture, the only logical options would have been: a) minority culture, b) not-minority culture, c) minority culture *or* not-minority culture (union), and d) minority culture *and* not-minority culture (intersection). He maintained that the same configuration occurred when examining the majority culture and explained that confusion arises when examining the two cultures concurrently. More specifically, misconceptions have occurred when adhering to the dominant culture meant not-minority or minority meant not-majority. He contended that when theorists have believed that only four combinations of acculturation have existed, which were predicted upon erroneous beliefs that "the universe of cultures" were limited to only two cultures, and "the intersection of two cultures is an empty set" or are completely different from one another Rudmin (2003) has argued that the fourfold theorists did not account for an individual who possessed indifference for one or both cultures. Another falsehood of fourfold theories has been that theorists determined that rejection of both cultures equaled marginalization, or no (null) culture. He has suggested that the rejection of two cultures might simply imply a preference for a third cultural option.

When Rudmin (2003) spoke of the comparison of two cultures, he contended that when researchers examined two different cultures, they examined two identities, two attitudes, and two languages, which were logically defined as $2^4$, or 16 acculturation combinations. The two cultures intersected (AND), were unified (OR), or separate from

one another. He defined the possible combinations as: a null set of 0; minority AND not dominant; not minority AND dominant; minority AND dominant; not minority AND not dominant; minority AND not dominant OR not minority AND dominant; minority; not dominant; dominant; not minority; minority AND dominant OR not minority AND not dominant; minority OR dominant; not minority OR not dominant; minority OR not dominant; not minority OR dominant; minority OR not minority = dominant OR not dominant).

Linda Tuhiwai Smith (1999) agreed with Rudmin ,as she suggested that acculturation was not a natural progression toward the assimilation of the minority culture, as previous researchers had implied. She contended that indigenous people had experienced historical invasions and forced assimilations in an attempt to exterminate their cultures. However, the individuals in the minority cultures had displayed resilience, and are now recovering their cultural ways. She described an indigenous movement of self-determination in the scientific genre, where indigenous peoples attained "social justice" (p. 116). Self-determination was not a serial process, but was ever evolving and incorporated four directions (healing, decolonization, mobilization, and transformation), as well as malleable tides of process (survival, recovery, development, and self-determination). The tides characterized the fluidity of life, behaviors, change, and thoughts of the indigenous population. The tides and directions intermingled and fluctuated constantly within the population.

The healing direction represented various aspects of healing for indigenous peoples: physical, spiritual, psychological, social, collective, and restoration. The decolonization direction incorporated four realms of decolonizing research regarding

indigenous people politically, socially, spiritually, and psychologically. The transformation direction encompassed psychological, social, political, economic, collective, and change. Finally, the mobilization direction included local, nation, region, and global mobilization in the processes of change in research.

The process of self-determination began with the survival of oppression, exploitation, and misrepresentation of indigenous peoples in the scientific realm. The next transition described was the recovery of the indigenous cultural practices, languages, lands and so on. However, she described recovery as a cumbersome process as external forces, not the culture, identified which of the indigenous elements recovered. The indigenous people weighed the selection of elements for which they identified. Often, the people selected the elements by the level of importance of the cultural elements to the culture, as well as determining the alteration or destruction of the element(s). The decolonization, or alteration of culture by oppression from the majority culture was thought achieved in the psychological, social, cultural, and economic realms.

Proponents of the multidimensional model argued that the acculturation process allowed individuals to select different components of both cultures. Choney, Berryhill, and Robbins (1995) viewed acculturation not as a dichotomous construct, but as a multi-faceted concept in which one did not accrue more of one culture to the detriment of another, but as varying degrees of biculturalism. Additionally, they proposed that acculturation status did not necessarily establish evidence of psychopathology, or that identification with the majority culture was the goal. They supposed that acculturation elucidated strengths and strategies of a minority individual to the adjustment of cultural values predicated by their environment.

Miller (2007) concurred with this premise and proposed that Berry's theory identified the process of acculturation as a bilinear, rather than a unilateral construct. Miller indicated that the fourfold model proposed instances in which the individual could adhere to native cultural components, acquire dominant cultural components, without creating a functional deficit in either culture. This definition of the fourfold model appeared to provide the possibility that the fourfold model was more fluid than previously thought. He tested the utility of the unilateral and bilateral models of acculturation with Asian Americans using a demographic questionnaire regarding their gender, ethnicity, age, place of birth, parents' place of birth, years lived in the United States, their generational status (e.g., first, second, etc.), and academic major. He also utilized the Acculturation Rating Scale for Mexican Americans—Revised (ARSMA–II), the Asian Values Scale, which measured adherence to the Asian culture for Asian Americans; and the European American Values Scale for Asian Americans, which assessed the degree to which Asian Americans have acculturated to European American values. He proposed that a bilateral unidimensional model of acculturation showed significantly greater fit with his sample, when compared to a unilateral model of acculturation. Secondly, he proposed that a bilateral multidimensional model (culture = values and behavior) elicited greater significance of fit than the bilateral unidimensional model. He analyzed the data using confirmatory factor analysis (CFA) with maximum likelihood estimation (ML), and found that the bilateral unidimensional model possessed greater fit with his sample than did the unilateral model of acculturation. Secondly, he also found that the bilateral multidimensional model possessed greater fit with his sample than did the bilateral unidimensional model of acculturation, lending support to

arguments that the process of acculturation were better represented by bilateral-based theories, rather than unidimensional-based theories.

Other researchers have contended that the multidimensional theory missed two important aspects in acculturation: meeting cultural guidelines for success in one or more cultures or not meeting the cultural guidelines of either culture (Oetting & Beauvais, 1990; Oetting, Swain, & Chiarella, 1998).

Therefore, Oetting and Beauvais (1990) proposed the orthogonal theory of acculturation. One of the main differences between the orthogonal theory and the multidimensional theory was the lack of cultural deficit when the individual identified with one culture over another. They contended that an individual's identification with one culture was independent from their identification with other cultures and not necessarily a transition from one culture to another. This meant that an individual could identify with more than one culture in without creating a deficit with another culture.

Another inherent feature of the orthogonal theory was that the individual could possess low identification with one or more cultures. This contention loosely followed the premise of a marginalized individual in the fourfold theory of acculturation. However, Oetting, Swain, and Chiarella (1998) contended that the fourfold theory assumed the individual possessed high identification with their culture of origin when they might not.

Trahan (2007) in an unpublished study, agreed in principle to the proponents of the multi or bidimensional models of acculturation in that an individual could navigate successfully and independently between two variant cultures. However, he argued that natural constraints existed that precluded the strengths of a multi or bidimensional

construct of acculturation. He argued that any given individual possessed a finite amount of time or resources when in contact with multiple cultural practices and belief systems. The finite resources naturally constrained the effectiveness of successful multicultural navigation. As an example, he provided the resource of time. Trahan proposed that any activity that required time from an individual (time for cultural practice, time for work, time for family) could take away from participation in other activities, depleting the individual's resources. He discussed that any one person could not be culturally present in two separate places at any point in time. If one partook in an activity that was based upon practices from one culture, that person could not also physically partake in an activity from another culture. He considered a cultural dissonance. He argued that the inherent differences between the two cultures, regardless of choice, and the resulting decision likely invoked stress on the individual. He described the stress affected how that individual viewed their abilities and effectiveness in either culture. He also indicated that he did not infer that a detriment in cultural activity is completely pejorative, only that the detriment is present in the context of time as a resource.

Acculturation has become an increasingly complicated construct to understand and examine. Most researchers have implied that minority status was based upon ethnicity or upon the number of individuals in a group, while others have proposed minority status was based upon power differential between cultures. For instance, Ogbu and Simons (1998) proposed that minority status was based upon power. They described that a "population is a minority if it occupies some form of subordinate power position in relation to another population within the same country or society" (p. 162). While Ogbu and Simons' views were based upon educational performance, it appeared that their

explanations were salient for many aspects of acculturation. They classified the minority groups as: autonomous, voluntary, and involuntary minorities. Autonomous minorities were people who belonged to groups with a small population. However, their educational and personal successes were similar to the majority group, despite minimal prevalence of discrimination from the majority. They determined that there were no non-white autonomous minorities in the United States. They determined that minority status (voluntary or involuntary) depended upon two criteria: the nature of White American involvement in how the group became a minority, and how or why the group came to be in the United States.

Ogbu and Simons (1998) described voluntary immigrants as people who had voluntarily moved to the United States stemming from expectations of greater opportunities than their country of origin. They supposed that voluntary immigrants possessed a "tourist attitude" (p. 165) pertaining to perceived prejudice, cultural and language differences. The voluntary immigrants possessed a knowledge and understanding that they would likely need to learn new ways of talking and behaving in order to experience success in their home. Ogbu and Simons (1998) proposed that possessomg this a priori knowledge reduced their fears of losing their cultural and language identities.

Involuntary immigrants have been defined as minorities who have been conquered, colonized, or captured as slaves by the majority culture and forced to assimilate to the majority culture. Involuntary immigrants were more likely to experience continued difficulties, educationally and economically, because of the many

avenues the majority culture forced their ways of being, thinking, and behaving upon the minority culture.

Ogbu and Simons (1998) described four ways that voluntary and involuntary immigrants differed: in their frames of reference, cultural theories of success, the degree of trust of other groups (especially White Americans), and their beliefs about the effects of adapting to White American practices upon their identity of self.

In terms of their frames of reference, Ogbu and Simons (1998) contended that voluntary immigrants possessed a more positive and dual frame of reference; or how they looked at a given situation. The duality of reference pertained to their own situation compared to their situation from whence they came. Voluntary immigrants tended to identify more opportunities for success than their own Country and viewed discrimination as a temporary situation. Involuntary immigrants possessed a more negative and dual frame of reference, however. Involuntary immigrants tended to compare their own economic and social status with middle class White Americans. They viewed their status as inferior and unequal to that of middle class White America. Involuntary immigrants also perceived discrimination and prejudice as more prevalent and stable, as they had experienced such for many generations.

Voluntary and involuntary immigrants also differed in how they viewed what it meant to be successful in the United States. Most voluntary immigrants believed that education, rule and law compliance, and hard work lent them in becoming successes in the United States. While voluntary immigrants also believed that education and work ethic were vital in becoming successful, they also believed that they were not enough to supplant racism and prejudice. The involuntary immigrants thusly believed that the

prejudice, racism, and discrimination were permanent fixtures in the United States, making it more difficult for them to succeed in White society. Their visions of role models differed as well. Voluntary immigrants viewed more acculturated, highly educated, and economically astute individuals as models of success. Alternatively, involuntary immigrants tended to view professional athletes or entertainers as successful, because they had worked hard, but were also stronger and more talented. They distrusted more typical professionals, such as doctors, lawyers, etc., because they assumed that for these individuals were required to acquiesce to the dominant culture's ways and lose their own identity in order to achieve success.

In terms of trusting the majority culture, voluntary immigrants tended to possess more optimism and trust about their interactions with the majority culture, which Ogbu coined as "pragmatic trust" (as cited by Ogbu & Simons, p. 174). They have tended not to question authority and have adhered to the laws and rules of the majority culture, as they believed doing so may have provided them with a vehicle toward success. Involuntary immigrants, however, have distrusted the majority White culture because of multi-generational experiences of racism, prejudice, and oppression. They tended to believe that they were treated differently from other groups, especially from the majority culture.

Lastly, the symbolic response defined the manner that the immigrants, both voluntary and involuntary, have viewed and interpreted the differences between their culture and language of origin and the majority, or White culture and language. Voluntary immigrants have tended to have more optimism and positive attitude when looking at the cultural and language differences. They arrived with the notion that they

would need to learn the majority's culture and language in order to achieve success. They tended to see the experience as one of benefit and tended to conform in the ways they believed would produce economic success, without affecting their own grasp of their culture and language of origin (Ogbu & Simons, 1998; Schwartz, Montgomery, & Briones, 2006). Involuntary immigrants, however, tended to view the differences as negative, as they were forcibly incorporated into the White culture. They tended to view the White cultural values and language as a threat to replace their culture and language of origin. Due to this belief system, many involuntary immigrants resisted the forced acquisition of language and culture, while some learned the White culture and language, they also experienced emotional and physical difficulties associated with the acquisition.

**Acculturation Stress**

Theorists defined acculturation stress as a construct that pertained to the conflicting ideals of two or more cultures and their effect on an individual attempting to navigate successfully between the cultures. This phenomenon was prevalent in all cultures where a perceived power differential was present. This construct received attention for research with most minority groups in North America (Duan & Vu, 2000; Fuertes & Westbrook, 1996; Kim, O'Neil, & Owen, 1996). Padilla's (1985) study concerning psychological distress between cultures was the genesis of the examination of individual distress and renamed acculturation stress.

Acculturative stress has been studied with the Hispanic population (Cueller, Harris & Jasso, 1980; Fuertes & Westbrook, 1986; Mena, Padilla, & Maldonado,1987; Rodriguez, Myers, Morris, & Cardoza, 2000), Asian populations (Duan, & Vu, 2000; Kim & Omizo, 2006; Kim, O'Neil, & Owen, 1996; Pawliuk, Grizenko, Chan-Yip,

Gantous, Mathew, & Nguyen, 1996; Suinn, Rickard-Figueroa, Lew, & Vigil, 1987; Yu, 1984; Zheng, & Berry, 1991), and immigrants from India (Krishnan, & Berry, 1992). However, few have studied acculturation stress with American Indians (LaFromboise & Bigfoot, 1988; LaFromboise, Coleman, & Gerton, 1993; Trahan, 2007).

LaFromboise, Coleman, and Gerton (1993) believed a person exhibited cultural competency when they displayed seven characteristics. The first characteristic was the individual's strong sense of self. The second characteristic was the individual had a sufficient knowledge base about the value and belief system of that culture. The third characteristic was the individual displayed empathy toward the affective and emotive processes of that culture. The fourth characteristic was the individual possessed the ability for efficacious communication utilizing the language of that culture. The fifth characteristic was the individual possessed an ability to behave appropriately within the boundaries of that culture. They described the sixth characteristic as the individual's ability to interact in an appropriate social manner within the group. Lastly, they described the seventh characteristic as the individual's ability to navigate effectively and appropriately within the culture.

Acculturation stress has been linked to numerous psychological concerns, such as suicide (Duarte, Bird, Shrout, Wu, Lewis-Fernandez, Shen, & Canino, 2008; LaFromboise & Bigfoot, 1988), depression (Beiser & Hu, 2006; Chen, Roberts, & Aday, 1998; Constantine, Okazaki, & Utsey, 2004) somatic issues (Kim & Berry, 1988, 1990; Daniel, O'Dea, Rowley, McDermott, & Kelly, 1999; Deyo & Diehl, 1983; Duarte, Bird, et al., 2008), and substance use (Blume, Resor, Villanueva, & Braddy, 2009; Caetano, Ramisetty-Mikler, Caetano-Vaeth, & Harris, 2007; Conway, Swendsen, Dierker, Canino,

& Merikangas, 2007; McQueen, Getz, & Bray, 2003; Smokowsky & Buchanan, 2009) with many minority cultures.

Rousey and Longie (2001) examined acculturation stress in terms of the retention of American Indian students in higher education. They compared the retention rates of American Indian college students and Caucasian college students in the Northern Plains and found that the retention rates for American Indian students were higher when the students attended an institute of higher learning located on their home reservation. Rousey and Longie (2001) attributed their findings to students possessed the ability to stay on their reservation and access their support systems in order to navigate the multiple stressors and demands placed upon them when studying for an advanced degree. They also indicated that the students that attended college on their reservations did not have the added stress of attempting to integrate their ways with the majority culture, while they experienced the stress of attending college. Rousey and Longie (2001) addressed the important relationship between acculturation stress and higher education retention strategies with American Indians.

In respect to acculturation stress, Ward (2008) proposed that the construct of Ethno-cultural Identity Conflict (EIC) possessed a relationship with acculturation stress, but was also able to stand on its own as a construct. To test her hypothesis, she utilized a culturally diverse sample of more than 300 first generation immigrants who completed a measure identified as the Acculturation Index, as well as a measure of ethno-cultural identity conflict that she had previously developed with colleagues, coined The Ethno-Cultural Identity Conflict Scale. Ward classified each participant as integrated, assimilated, marginalized, or separated, based upon the fourfold theory model by Berry.

After completing the classification of the participants, she analyzed their scores on the Ethno-Cultural Identity Conflict Scale and found that integrated individuals experienced a significantly reduced amount of identity conflict when compared to the other acculturation groups. She also found robust, positive correlations between EIC and depression, psychological symptoms, and social difficulty. She found moderately robust, negative correlations between EIC and life satisfaction, as well as with school adjustment. A weaker, positive correlation existed between EIC and behavioral problems.

Additionally, in an unpublished study Trahan (2007) examined the relationship between acculturation identification and acculturation stress. In doing so, he examined correlations between the distance American Indian college students were from their families; and the number of years lived on/off of an American Indian reservation, their gender, cultural identification, and perceived acculturation stress. He also measured the relationship between the Native American Acculturation Scale (N.A.A.S) with scores of perceived acculturative stress on the Social, Attitudinal, Familial, and Environmental (S.A.F.E.) Acculturation Stress scale. He found a positive relationship between the years AI/AN undergraduate students had lived *on* a reservation/village related to higher, although not statistically significant, perceived acculturative stress as measured by the S.A.F.E. scale. He also found that living on the reservation/village did not appear to be a significant predictor of overall acculturative stress scores.

Trahan did discover a significant, negative relationship between the numbers of years lived on a reservation/village and scores on the N.A.A.S. Specifically, that AI/AN students who lived most of their lives on a reservation/village, achieved lower scores on

the N.A.A.S., which indicated adhering to their culture of origin. He also found that the N.A.A.S. was a good predictor for scores on the S.A.F.E. scale, indicated by a negative, significant relationship found for the N.A.A.S. and the S.A.F.E. scales. Gender, however, was not a significant predictor for reported acculturative stress in his study.

**Studies with American Indians**

The above studies have not been an exhaustive review of the research conducted with American Indians, however. When the numbers of studies conducted with American Indians were compared to the number of studies conducted with other ethnic groups, American Indian studies have made up a small percentage of the studies available. This lack of substantial empirical research might have correlated to the relatively small percentage of American Indians in the overall population of the United States. According to Ogunwole (2002) the 2000 census reported American Indians comprised less than one percent (.9%), or 2.4 million people, of the total population of the United States. The results of the 2010 census, however, indicated that approximately 2.9 million people identified themselves as American Indian; an increase of roughly 500,000, but still less than one percent (.9%) of the total population. Information retrieved from the 2010 census identified a total of 5.2 million people identified as American Indian/Alaska Native "alone or in combination," which comprised 1.7% of the total population of the United States.

There are 564 federally recognized tribes in the United States (retrieved from United States Bureau of Indian Affairs, 2010). Despite the population disparity, American Indians, on average, reported more psychological and physiological concerns than any other population. Almost 13 percent of American Indians surveyed reported

frequent mental distress (Indian Health Service, 2001). Therefore, it is important to identify valid and reliable tests to measure acculturation and acculturation stress with American Indians, to better develop culturally appropriate measures, as well as improving the implementation of culturally appropriate therapeutic interventions.

Given the inherent differences between minority cultures, it is not surprising that many culturally specific (i.e., emic) acculturation and acculturation stress measures were developed. Berry (1989, 1999) described the term emic as a specific knowledge, understanding, and interpretation of psychological terminologies and constructs in a particular culture's nomenclature.

Based upon Berry's concept, Suinn, Rickard-Figueroa, Lew, and Vigil (1987) developed the Suinn-Lew Acculturation Scale. This scale was an emic (i.e., cultural specific) scale for the Asian population. There were a number of acculturation and acculturation stress measures tailored for the Hispanic population, most notably the Acculturation Rating Scale for Mexican Americans (Cuellar, Harris, & Jasso, 1980) and Social, Attitudinal, Familial, and Environmental acculturation stress scale (Mena, Padilla, & Maldonaldo, 1987). Hence, the importance of determining the validity and reliability of the instruments developed to measure acculturation and acculturation stress with American Indians is paramount.

**Validity**

Statistical validity consists of four-to-five major aspects: predictive validity, concurrent validity, content validity, construct validity, and face validity. Cronbach and Meehl (1955) discussed that predictive and concurrent validity could be combined to obtain a classification of criterion-oriented validation procedure.

Predictive validity was described as the test's ability to predict a criterion that is of interest to the researcher. For example, a researcher may wish to predict level of acculturation with a sample using an instrument that measures acculturation to some degree. The predictive validity of the acculturation instrument was how well the scores on the instrument predicted acculturation status (dependent upon which theory they subscribe: unidimensional, bidimensional, or orthogonal) of their sample.

Concurrent validity consisted of testing whether two separate measures correlate well and could be used in place of one another. For instance, if a researcher wished to study the concurrent validity associated with an acculturation measure, say the Native American Acculturation Scale (N.A.A.S.), one would test the N.A.A.S. with another proposed acculturation scale to determine whether the two instruments measure the same criterion.

Content validity is the ability of the test to measure the content that the researcher wishes to examine. Cronbach and Meehl (1955) elaborated that content validity was predominantly a product of deductive reasoning and allowed the instrument to choose the items in the instrument. For instance, if one constructed a measure of acculturation, the researcher chose each item incorporated into the measure by examining the item(s) and determining whether the item contained information about what they were measuring. Content validity was the precursor and important cog of construct validity (Haynes, Richard, & Kubany, 1995). Content validity elicited evidentiary support for the items of the measure, as they related the instrument against the theoretical construct measured. When constructing and/or utilizing assessment measures, the content validity is the measure affecting the measure's ability to correctly infer about the clinical picture of the

individual. For instance, if one administered a depression measure to a client, the measure would not possess clinical utility if it did not also possess content validity in examining depressive symptoms. Such a measure is clinically useless, as it did not possess the ability to infer about the presence or intensity of depression.

However, because an instrument had shown content validity (and therefore, some extent of construct validity) that did not ensure the instrument possessed content validity unconditionally. As the knowledge base of constructs and the theories related to the constructs increased and changed, the content validity of the theory or assessment measure possessed instability and eroded over time. Therefore, it was wise to examine the assessment tool periodically and adjust it to represent any changes in the construct that the instrument examines.

Cultural validity (Hennessy & John, 1995) was a key component to content validity. Cultural validity referred to the extent the items of a measure represented the cultural beliefs, attitudes, behaviors, and emotional expressions of the identified sample. For instance, a measure that examined acculturation stress with American Indians would not possess cultural validity if the items of the measure tapped into the beliefs, attitudes, behaviors, and emotional expression of "Western Culture" (where autonomy and independence were paramount aspects of Western culture). Making such an error can create a biased representation of the sample examined.

Face validity was the least important of all forms of validity. It was the most controversial form of validity. Face validity is whether the instrument *appeared* to measure the construct researchers developed it to measure. Many researchers considered this form of validity as the least important as it was a subjective estimate and did not rely

on statistical measurement (Cronbach, 1971; Newfields, 2002; Sartori & Pasini, 2007; Trochim, 2006). However, some contended that face validity was useful, as researcher could not always spend excessive amounts of time attempting to validate a measure, using the more acceptable types of validity, when face validity was not present (Roberts 2000). Nevo (1985) argued that formulae existed to determine the face validity of a measure. He posited that face validity possessed the ability to assist determining the amount of reliability acceptable for the purposes of research.

According to Trochim (2006), the test used to measure a construct was defined as "the population of interest" (pg. 1). He described the sample used to measure the population as the "operationalization" (pg. 1). Therefore, construct validity pertained to the approximation of truth that the sample (operationalization) reflects the population (construct). He categorized face validity as part of "translation validity" (p. 1). While Trochim stated that face validity was the "weakest" type of validity, he also believed that it was more salient and acceptable when those assessing the face validity were experts in that theoretical construct. He also cautioned not to determine the validity of a measure solely on its face validity, but endorsed incorporating the more mathematical forms of validity as well. The commentary by Trochim was most salient when validating new tests or instruments. While face validity possessed utility in test construction, one must not completely forego more traditional, mathematical forms of validity to save time.

In addition, face validity possessed inherent subjective beliefs by the examinees, whether laypersons or professionals. Some posited that face validity was susceptible to response bias because of the examinees (layperson or expert) attempts to predict the construct measured by the test (Kline, 1993; 1998).

Sartori (2009) identified six difficulties inherent with utilizing face validity. The first difficulty was researchers utilized face validity after test construction, rather than an aid in constructing the instrument. Another difficulty was face validity often elicited compliance from consultants; meaning, those who have been consulted to validate a measure usually do so because they believed they were expected to and not because of statistical evidence. An additional difficulty of face validity was information was often qualitative and considered true without a quantitative verification. An additional difficulty was face validity was often superfluous and finalized from the brief observations of examinees without statistical quantification. Face validity was often determined from given perspectives of a few, without utilizing statistical procedures to validate the subjective opinion. Often, test developers utilized face validity to save time and effort, ignoring intensive validity and reliability tests.

Again, while face validity possessed advantages in reduced time, simplified the efforts to validate a test, and was a parsimonious starting point in ascertaining content validity, face validity was not the primary validity indicator of a measure. More robust and more extensive statistical procedures, such as exploratory factor analysis were preferred. Depending solely on face validity increased the probability of misrepresenting the basis of the theory, as well as the overall construct the tool attempted to measure.

When compared with face validity, predictive, concurrent, and content validity were difficult to ascertain when evaluating psychological constructs. Carmines and Zeller (1979) summarized the opposite viewpoints from Nunnally (1978) and from Bohrnstedt (1969) in that content validity was marginal, at best, when testing the validity of a measure in psychological research. The consensus was that the content of most constructs

in the realm of psychology were abstract and not entirely definable. Therefore, if the content was difficult to define, then it was also difficult to measure the validity of the instrument adequately.

Lastly, construct validity was the test's ability to measure an underlying construct or theory that the items of the test wished to capture. Cronbach and Meehl (1955) summarized constructs as proposed traits about people statistically validated by means of measurement. These proposed attributes led to a set of predicted, potential behaviors of individuals. Construct validity was related to a tool's ability to measure a construct. It was a concept that was not available for direct observation. Construct validity was not entirely definitive in terms of whether a measure did or did not possess the attributes necessary to examine and measure the underlying construct. The common beliefs are that constructs are latent (unobservable) in nature, are difficult to measure, and possess a multitude of subjective definitions.

Cronbach and Meehl (1955) indicated that construct validity was present whenever a measure accurately interprets a human attribute or quality, which may or may not possess an operational definition. In order for an attribute or construct to be operationally defined, it must adhere steadfastly to the definition of that particular concept. In fact, Ebel (1961) offered that operational definitions are at the core of any physical measurements (i.e., length, weight, time, etc.). He continued by inferring that operational definitions could be utilized to measure basic mental elements as well, despite the fact that mental concepts are not particularly physical in nature. However, in terms of constructs, either novel or repeated, each researcher's definition of the construct was subjective and multiple aspects concerning the definition might not be similar from

one researcher to another. Cronbach and Meehl (1955) also mentioned this difficulty when they explained construct validity was vital and best utilized when no criterion was acceptable in defining the construct in question. They added that constructs were not validated by performance when comparing the validity of the construct and the performance of the sample for which the construct was measured. Cronbach and Meehl (1955) indicated that validity and performance did not possess a linear relationship with one another. Thus, constructs cannot be explained by observed behaviors alone; other aspects about the proposed construct should have been considered. They also supposed that factor analysis was the most important psychometric test available for validating constructs. However, they also argued that construct validity could not be explained by a singular validity coefficient. Rather, they contended that validity coefficients offered upper and lower limits, which provided a range of the variance for the criterion explained by the instrument(s).

Ebel (1961) questioned whether tests must be valid. He proposed various difficulties with validity: in terms of the definitions of validity, the types of validity, the evidence of validity, and the essentialness of validity. He argued that the definitions of validity appear subjective, given the inherent flexibility and enhancements to the definition of validity by various researchers. He indicated conceptual differences in terms of the validity of the measure. He identified the correlation with the criterion, the estimation of corrected correlation coefficient (subtracting for error in measurement), the accuracy related to the user's intent of the measure, whether the user utilizes the measure correctly, the supposition that validity was equal to utility, and the interpretability of the scores from the measure. He also inferred reasons why there were difficulties with

validity. He cited scientific adequacy, in that validity was contingent upon validity. In other words, the validation of a test to measure acculturation stress relied upon whether the construct of acculturation stress was validated by researchers before the development of the test. Ebel indicated that this concept created its own redundancy of questions where one criterion required the validation of another criterion, which required the validation of that criterion, and so on.

Another difficulty in terms of validity was the philosophic adequacy of validity. Ebel (1961) contended that researchers in psychology believed that a real, measurable trait was the underlying concept for scores on a given test, which at best, are only estimates. Thus, researchers were never sure whether the experiment sufficiently explained or measured the construct. Ebel also supposed that validity was overgeneralized to the extent that the concept or construct became too broad that it could not be explained parsimoniously. He contended that validity could be confused with utility because of the broad definition of the construct

Cultural validity is a newly emerging component of validity that has been studied—and I sent some articles to you that describe this. .

**Reliability**

Researchers have examined the consistency, or reliability, of instruments since the development of measures concerning human traits and behaviors. Kelley (1921) defined the reliability of a measure as the consistent ability for the measure to quantify a construct in the real world. He also offered a list of nine propositions that determine the reliability of a particular variable, which was altered over time, to the extent that approximately half of the propositions now define ideals of validity. These propositions

elucidated the connection between validity and reliability and both were paramount when testing measures.

When examining reliability in the realm of mathematical theory, the consensus of researchers and theorists was reliability encompasses three important entities: the observed score, the true score, and error. The observed score was the score of each individual item of an instrument. The observed scores from one participant were, or should have been, different from any other participant. The true score was an average score a person displayed if they completed the measure an infinite number of times. Cronbach (2004) explained error in the reliability of a measure as the difference between the observed score and the true score for any participant tested. He added that the alpha formula was no longer the most appropriate way to examine reliability. Instead, he supplied support for the generalizability theory, or g-theory. Given the difficulty in configuring g-theory, researchers used Cronbach's alpha when they explained reliability.

When utilizing alpha to determine the internal consistency of an instrument, Cronbach (1988) identified three basic assumptions: the participants did not change biologically when tested more than once; the number of participants available for testing was inherently large, and items present in the instrument were independent. The second assumption meant there were many participants available to choose from that participated in the administration of the instrument. Independence meant that the occurrence of one event (e.g., item answered on an instrument) did not affect or exude interference upon another, separate event. Cronbach (2004) identified the independence of the events did not need a perfect correlations, but enough so the response to one item of the instrument had not affected the response on another item in the same instrument.

At the genesis of measuring reliability, prior methods examined the correlation, or relationship, of the scores obtained from two different forms of that particular test. One such method was labeled the split-half method, in which the measure was split in half, either by an even/odd, or a first-half, second-half configuration. These halves were separate tests and considered a measure of internal consistency, or stability, of a score for any item. The epitome of internal consistency was a value of "1," termed perfect internal consistency.

Frederic Lord (1955) believed that the Kuder-Richardson coefficients derived from formulae 20 and 21 explained the correlation between an actual test and a conceptually equivalent parallel test. He defined tests as being conceptually parallel when the items from two separate tests were drawn from the same pool of items at random. Lord also explained that various definitions of parallelism were prevalent and his study focused upon determining which definition of parallel correlated with which Kuder-Richardson coefficients. He proposed that one of the definitions of parallel would add to the practicality of the KR21 formula and coefficient, and that the alternative definition of parallel would lead to a novel reliability coefficient, which he identified as the matched-forms reliability coefficient. However, as this coefficient was novel and theoretical in nature, the coefficient was also difficult to calculate.

Cronbach and Gleser (1959) refuted Lord's arguments about the alpha coefficient and reliability. They argued that the primary concern, when examining an instrument's reliability, one should wholeheartedly examine the greatest extent of risk concerning interpreting the obtained coefficient, instead of examining the average risk of error, which Lord believed as primary. They elaborated their viewpoint by stating when

examining an individual and determining whether they were near particular cutoff scores, might appear as a conservative procedure, a great amount of risk was inherent when making the decision. They also supposed that examining maximum risk was more suitable for reducing erroneous decision making at an individual level. The maximum risk model, in their opinion, increased the level of confidence associated with a decision by establishing a cut-off point. The cut-off point increased the confidence because the cut-off point was set at an unlikely probability, such as $p > .001$. Scores of individuals that fell in the extremes possessed less probability of making an error when the researcher made a decision. The extreme scores artificially inflated or deflated the mean and increased the average risk associated with that particular decision.

Cronbach and Gleser (1959) however, also warned against basing the utility of the decisions on the maximum risk decision model. They indicated that in order to look at the utility of the decision, one must examine both the maximum risks and the average risks in terms of the type of decision made. They described two different types of decisions: individual decisions, in which the decision served only the individual making the decision, and the institutional decision, which they described as a decision that affected an entire group. They supposed that the institutional decision and calculating average risk was applicable to one another, as was utilizing the maximum risk when examining individual decisions. These proposals made sense when one thought about the definitions of the two decision models. An institutional decision was based on multiple decisions that pertained to that institution; hence, an average risk formula seemed logical. Conversely, when examining an individual decision model, which only affected the

individual, calculating the maximum risk of error for that individual appeared the best approach as well.

Cronbach and Gleser (1959) partly agreed with Lord that no coefficient, either validity or reliability, could completely interpret a particular score by themselves. They differed, however, in that they believed that the importance pertaining to the decision and the rules utilized to interpret the scores obtained were also of importance when investigating validity and/or reliability.

Lee Cronbach (1951) examined coefficient alpha and inferred that testing the internal consistency of measures were necessary to determine the utility of the measure studied. However, *how* the measure was examined (split-half, parallel split, etc.) was most important to determine the utility of the measure. Cronbach indicated that the reliability coefficient was a tool to investigate whether the test designer was correct in assuming that a certain compilation of items could have elicited inferable testimony about differences between individuals. He also indicated that in order to achieve an adequate representation of the validity and reliability of a measure, the amount of variance attributed to measurement error also must have been calculated.

Historically, numerous administrations were needed in order to obtain psychometric properties about a given measure. However, the multiple administrations could have proven problematic and cumbersome to both the administrator and to the participants. Simpler avenues existed in order to obtain the true consistency of the measure without administering a measure infinitely. Cronbach identified the practice of splitting the measure in half and rescoring the measure, one-half at a time, obtaining two separate estimates from the same administration of the measure. The Spearman-Brown

formula was the primary formula for determining the reliability coefficient, but had been replaced by formulae by Rulon and Guttman (1939), as these formulae were viewed as more reliable split-half coefficients of equivalence than the Spearman-Brown formula. The Spearman-Brown formula consistently appeared elevated when compared to the coefficient of equivalence. Hence, Kuder and Richardson (1937) arithmetically derived the Kuder-Richardson formulae 20 and 21 and reported to never overestimate the reliability of a measure and hypothesized that their formulae were applicable in any test of reliability, with KR21 possessing more of an all-purpose practicality. They believed KR20 possessed advantages in situations where the level of difficulty of the items varied. As a result, Kuder and Richardson (1937) proposed an additional premise or assumption that the test should be viewed in terms of the positive interrelationships between the items that make up the test. They also concluded, for the instrument to contain any realistic reliability, the interrelationships of the items in the instrument *must* be positive, as negative intercorrelations were not acceptable.

In his 1951 article, Cronbach supposed that the Kuder-Richardson formula 20, KR20, was the overall mean of all of the split-half coefficients. He believed it was also the expected value of two separate, random samples of items from the same group, was also the lower bound value when examining for the coefficient of precision, and acted as a lower bound estimate of the variance of the measure explained by common factors among the items of the measure. Later, Kuder and Richardson derived the Kuder-Richardson formula 21, KR21, which possessed the same mathematical attributes as KR20, but also treated the questions of the measure as if they were equally difficult. KR20 did not assume this premise.

The split-half coefficient was introduced as a replacement reliability measure, as the test-retest coefficient overestimated the reliability of an instrument. Kuder and Richardson (1937) supposed that the participant acquired a memory concerning the items of the instrument at the first administration of the instrument. According to Kuder and Richardson, the memory of the test was set in the individual and no amount of time could reduce that memory of the item. This memory produced an artificially elevated reliability coefficient for the item.

**Factor Analysis**

Factor analysis was a statistical procedure utilized to reveal latent variables that elicited covariation between items, and/or examine the validity of items contained in a measure with a specific sample. There were two forms of factor analyses: exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Each analysis possesses strengths and weaknesses, and were utilized for specific purposes for the researcher. While researchers had utilized either an EFA or CFA, some have incorporated both types of analyses to test item inclusion and to test the validity of the items to the sample (Moran, Fleming, Somervell, & Manson, 1999).

Exploratory factor analysis was based upon the common factor model, which assumed that each item in the test, or battery, was a linear function of one or more common factors. The common factor model also accounted for any correlations, or covariances, among the measured variables or items due to the influence invoked by one or more common factors. The model also subsumed that a unique factor was also involved. A unique factor was a latent variable that only exuded influence upon one item

in the test and included a component of error measurement, defined as the lack of consistency of the measured variable.

The data from the sample primarily drove exploratory factor analysis, to which EFA established avenues to decipher the number of factors and factor loadings from the data. Exploratory factor analysis was a better statistical approach when the researcher did not possess information, theoretical or empirical, to predict the number of common factors or what variables the factors influence. While there have been a number of studies examining acculturation measures other ethnic groups, little was known with an American Indian sample. EFA could have proven beneficial when the investigator had discovered their model had not shown good fit with the sample data. The EFA could have parsed out other possible factors inherent in the sample data or assisted in providing specific factors did not fit with the sample data. This was particularly true with the measures in this sample: the N.A.A.S. was devised with a sample from members of numerous American Indian tribes from the East region of the United States; the S.A.F.E. was developed for use with Hispanic individuals.

There were numerous procedures to use when conducting an EFA: maximum likelihood, principal factors with a priori estimation of item communalities, and iterative principal factors (Fabringer, Wegener, MacCallum, & Strahan, 1999). All procedures possessed strengths and weaknesses, although they had fit similar common factors to the data. The largest strength of maximum likelihood procedure was it computed an array of goodness of fit indices for the common factors model (i.e., Root Mean Square Error of Approximation, RMSEA and the Expected Cross-Validation Index, EVCI), which examined the extent the data from the sample matched or "fit" the theory or the tool

utilized to measure the theory. However, most goodness-of-fit indices were affected by sample size. They were affected in that one can "reject" the theory by over-saturating the data with an exuberant sample size. Instable results also occurred when the sample size is small, or below one hundred. Marsh, Balla, and McDonald (1988) argued against sample size influence and provided goodness-of-fit indices that did not appear affected by extremely large or small sample sizes. They proposed that sample size should not affect the most used goodness-of-fit measures; the instrument should have displayed accuracy and consistency when elucidating the differences between various goodness-of-fit models in measuring the same data set, and for examining multiple sets of data; that the results should be interpreted easily; and possessed an inherent ability for replication.

They examined three types of fit indices: stand-alone indices, Type I incremental indices, and Type II incremental indices. They found all 10 of the stand-alone indices they examined (the maximum likelihood fitting function, FF; the Scaled likelihood ratio, LHR; $\chi^2$ ratio; $\chi^2/df$; Lisrel's root-mean-square residual, RMR; Goodness-of-fit index, GFI; the Adjusted Goodness-of-fit index, AGFI; the Cudek and Browne's information criterion, CAK; the Schwartz information criterion, CSK;, and Critical *N*) were all affected by large sample sizes. However, of the ten stand-alone indices, they found that the Goodness-of-fit index (GFI) was affected the least by a large *N*. In their examination of Type I incremental indices, they found that these indices were not immune to the effects of sample size and actually had shown worse utility as fit measures than the stand-alone indices. They also found that the Type II incremental indices functioned more efficiently in their study. Despite the more favorable performances of these indices, little more than half (5 of 9) possessed immunity against the effects of sample sizes.

This procedure also statistically tested the significance of item factor loadings, as well providing confidence intervals for the loadings. The RMSEA was an estimation of the difference between the model and the data from the sample, per degree of freedom for the model. A difference of less than .05 connoted good fit. A difference range between .05 and .08 was acceptable. Marginal fit was a difference range between .08 and .10. Finally, a difference range over .10 was a poor fit. The ECVI estimated the generalizability of the solution from one sample to another sample. Small ECVI products inferred higher generalizability of the solution between samples. However, the disadvantage of using maximum likelihood was the procedure assumed the variables were within the normal curve. If variables did not fit within the normal curve, the results were difficult to interpret.

The main strength of both types of principal components factor analyses (iterated and non-iterated) was that they did not depend on the assumption of the results falling within a normal curve. However, Costello and Osborne (2005) proposed that principal components analysis (PCA) was a "true method of factor analysis" (p. 2) and the genesis of the procedure was due to the expense and time required to conduct factor analysis with computers. PCA was less expensive and easier to compute than was factor analysis. One weakness of PCA was that it did not give the researcher a similar amount of goodness of fit indices as maximum likelihood. Additional weaknesses of PCA was it was solely a data reduction method, was computed without acknowledging an underlying structure born from latent variables, did not differentiate between the shared and unique variances of items (Costello & Osborne, 2005), and produced overestimated values of variance when the factors were not related (Gorsuch, 1997). The principal components

approaches also did not supply confidence intervals for the factor loadings, nor did they provide ways to test the statistical significance of the loadings. The principal components' inability to provide this information made it difficult for the researchers to infer if the model fit the data. This difficulty also left questions concerning whether items were suitable for the instrument used with the sample. Not knowing the confidence intervals made it difficult for researchers to establish construct, content, and concurrent validity, as well as internal consistency (reliability) of the measure.

A quandary existed when researchers attempted to establish the number of factors in a measure. The researcher needed to ensure that the measure possessed enough common factors to account for the relationships inherent in the items measured and thusly, the construct. The researcher also needed to ensure that there was not an overabundance of factors in the instrument, so to not dilute the efficacy of the instrument to measure the construct. However, underspecifying the number of factors in a battery (underfactoring) was more detrimental than specifying too many (overfactoring). However, both involved the likelihood of greater error, in terms of items erroneously loading into two or more factors that were both included and not included in the model. This created an item loading that did not represent the factor. For instance, an item on the Native American Acculturation Scale (Garrett & Pichette, 2000) which asked about language fluency, might have loaded in a factor pertaining to language, while it also loaded into the factor of identity, or another factor not included in the model. Wood, Tataryn, and Gorsuch (1996) stated that underfactoring also led to a poor loading estimate of the items in the factors, even if the factors loaded into the model.

Despite possessing error, overfactoring was more desirable than underfactoring as it possessed less error in the estimation of the item factor loadings. However, overfactoring was not without problems (Comrey & Lee, 1992). Overfactoring possessed problems with complex constructs and theories. The problems occurred when overestimated factors did not possess much value to the construct or theory, as it may not have related to the theory or construct. Thus, making the researcher believe a minor component was greater than it really was.

Researchers proposed more optimal strategies for establishing the number of factors in an instrument. For instance, they examined the eigenvalues of factors and only included factors that possessed eigenvalues over one (1.0) in the instrument. This procedure also possessed inherent problems, one argument against utilizing eigenvalues was that researchers often examined the wrong eigenvalues from their analyses. Eigenvalues from the unreduced correlation matrix provided a more accurate representation of factors and their unities were preferred, rather than examining eigenvalues with communalities. Another argument against eigenvalues was that it was a subjective and arbitrary rule to keep items with values above one (1.0) and omit items with values of .90 to .99. While it was true that such items may not have been valuable to the instrument, excluding a factor that approaches 1.0 (.95 to .99) might omit pertinent information as it related to the construct measured.

Another accepted, alternative approach was the scree test (Cattell, 1966; Cattell & Jaspers, 1967; Costello & Osborne, 2005). To establish the scree model, the eigenvalues from the correlation matrix, or the reduced correlation matrix, were computed and graphically plotted (with an X an Y axis) from the largest eigenvalue to the smallest. The

researcher then examined the graph to identify the final "substantial drop" (Fabringer et al., 1999, p. 278) or "the number of data points above the break" (Costello & Osborne, 2005, p. 3) on the graph of eigenvalues. However, the scree plot was not without criticism. Kaiser (1970) argued that the scree test was obtuse and subjective, in that there was no definitive way of determining the drop-off point in eigenvalues. Researchers may have chosen to identify the drop off in accordance with what they theorize, rather than what was shown in the plot. In some circumstances, the scree plot may not have possessed a large enough drop to establish the factor cut-off. Proponents of the procedure have argued that when the common factors were strong, a clear and decisive drop-off was observable (Cattell & Vogelmann, 1977). When the factors were clustered and the researcher had difficulty establishing the break point of factors in the scree plot, Costello and Osborne (2005) suggested implementing multiple factor analyses when the factors suggested in the scree plot did not match the predicted number of factors. They endorsed running the at least four analyses, in which the researcher set the number of factors (two above and one below the predicted number of factors) for extraction in each analysis. For example, if the researcher expected five factors in their instrument, but the scree plot indicated four factors, three additional analyses, setting the number of factors at three, five, and six. After rotating the factors, either orthogonal or obliquely, Costello and Osborne (2005) suggested to compare the item loadings from the four analyses and determine which produced the best factor structure. They defined a "clean" factor structure as a structure that contained "item loadings above .30, no or few item crossloadings, and no factors with fewer than three items" (p. 3). Crossloading items are items that load into two or more factors at .32 or above. A high number of crossloaded

items indicated poorly worded items, or an incorrect factor structure. Strong factors, were considered rare, but desirable in factor analysis. These were factors with five or more strongly loaded items (.50 or above) and minimal crossloading items, if any.

An additional process that established the number of factors in a model was the parallel analysis introduced by Horn (1965). Parallel analysis compared the eigenvalues from the sample data to eigenvalues expected when analyzing random data. The strength of parallel analysis was that the eigenvalues produced account for sampling error in the items of the measure (Thompson, 2004). However, the acceptance and omission of factors based upon the eigenvalues were subjective, and missed additional information about the factors with values just below the cut-off.

Model solutions were predominantly more than one factor. As there were usually more than one factor, there were a number of orientations of the factors in space that explained the data. The most common avenue for selecting appropriate solutions in EFA was using simple structure decision making. Thurstone (1947), as cited by Fabringar et al. (1999), proposed the simple structure as the "most interpretable, psychologically meaningful, and replicable" (p. 281). In order to identify the most simple structure solution, Thurstone proposed rotating the factors in multidimensional space.

The most common rotation methods were orthogonal and oblique rotations. The purpose of rotating factors was to simplify and clarify the structure. A common misconception was that rotation improved the amount of variance extracted from the items (Costello & Osborne, 2005). Orthogonal rotation was the most used method, specifically, varimax rotation. Orthogonal rotation required that the factors were independent from one another, hence, more easily interpreted. However, since most

constructs in psychology possessed factors that were related in some way, the orthogonal rotation method was not applicable in most instances. Using orthogonal rotation methods often missed valuable information when the factors were correlated with one another. Costello and Osborne (2005) discussed both types of rotation. While information was lost using orthogonal rotations with correlated factors, the opposite was found when using oblique rotation methods with unrelated factors. They determined that orthogonal and oblique rotation methods performed similarly with independent factors. Oblique rotation, however, allowed for the correlation between the factors, thus, made it more desirable for use when conducting factor analysis. They preferred oblique rotation methods, as oblique methods could "reproduce an orthogonal solution but not vice versa" (p. 7).

This researcher utilized SPSS 17.0 to conduct exploratory factor analyses on the Native American Acculturation Scale (N.A.A.S.) and the Social, Attitudinal, Familial, and Environmental (S.A.F.E.) Acculturation Stress Scale to determine the factor structure from this sample. This researcher chose the promax rotation method, as the oblique rotations allowed for correlation between the factors in each measure evaluated and did not omit valuable information when the factors were correlated. Adjunct fit indices were utilized to obtain a preliminary outlook between the fit of the model to the data from this pilot sample. The overdetermination of factors, the item-to-factor ratio (*p:r*), scree plot, and the $\chi^2$/df were also used to infer the fit of the overall model to the data, as well as the applicability of factor loadings with this pilot sample.

## Hypotheses

The first hypothesis for this study is that the N.A.A.S. will not possess adequate validity or reliability for utilization with American Indians college students. It is also expected that the factor structure of the N.A.A.S. will differ with this sample. The second hypothesis is that the S.A.F.E. scale will not possess adequate validity or reliability for utilization with American Indian undergraduate college students. It is expected that the factor structure for the S.A.F.E. will differ with this sample. It is expected that alpha coefficients will be similar to the coefficients found in the study by Trahan (2007) where the N.A.A.S. achieved an alpha of .87 and the S.A.F.E. achieved an alpha of .90, ($n$ = 40) respectively.

## Method

### Participants

One hundred and eleven (111) American Indian undergraduate and graduate participants gave informed consent and completed the electronic surveys distributed in the spring of 2010 and the winter of 2011. The researcher sent a recruitment e-mail, via the American Indian Student Services (AISS) Office Manager at The University of Montana, to prospective participants a total of seven (7) times (four during the spring of 2010 and three times during the Winter 2011 data collection). Twenty-two participants (22) replied to the first issuance of the recruitment e-mail in the spring of 2010. The researcher sent a second recruitment e-mail in 2010, with the assistance of the AISS office manager three weeks later. Seven (7) additional participants completed the survey. The researcher sent a third issuance of the recruitment letter in 2010, with the assistance of the office manager of AISS two weeks later. Thirteen (13) participants responded. Lastly, the researcher sent a fourth issuance of the recruitment letter three weeks later, eliciting nineteen (19) responses. Sixty-one (61) participants completed the electronic survey in the spring of 2010. However, three (3) participants did not complete the survey and one (1) participant disclosed being under the age of eighteen, which prevented completion of the survey. Therefore, fifty-seven (57) participants completed the survey in the spring of 2010 and were included in the overall analysis.

The primary investigator also collected data in the winter of 2011, with the assistance of the American Indian Student Services (AISS) office manager, via the AISS listserv at The University of Montana. The investigator sent an identical recruitment e-mail (see Appendix D for an example) to prospective American Indian undergraduate and

graduate students at the university. Twenty-five (25) participants replied to the first issuance of the recruitment e-mail from the second data collection. The investigator sent another recruitment e-mail two weeks later, which elicited fourteen (14) responses. Lastly, the investigator sent a third issuance of the recruitment letter two weeks later, which elicited eleven (11) responses. Seven (7) participants gave informed consent to participate in the study, but did not complete any of the electronic surveys from the second data collection. Therefore, one hundred (100) participants gave informed consent and completed the electronic surveys during the two data collection periods in the spring of 2010 and the winter of 2011. These participants were included in the drawing for one of six $25 Visa gift cards.

## Measures

### Demographics Questionnaire.

The investigator provided the participants with a general questionnaire to acquire basic demographic information (see Appendix A). The questionnaire asked the participants a range of questions: their age; their gender; the American Indian tribe or Alaskan village of which they identified; whether they were an enrolled member of the Tribe or Village; whether they were a descendant (i.e., their parent(s) or grandparent(s) were enrolled, while the participant was not); their current school year status; the number of years they lived on an American Indian reservation, and the number of years they had lived off of an American Indian reservation.

### The Native American Acculturation Scale (N.A.A.S.)

The Native American Acculturation Scale (N.A.A.S., Garrett & Pichette, 2000) is a 20-item, Likert scale (1= low acculturation, to 5 = high acculturation), based upon the

Fourfold Theory of Acculturation by Berry (1980). The N.A.A.S. (Appendix C) consisted of six total factors that included items that pertained to language (questions 1, 2, 3, and 16), identity (questions 4, 5, 6, and 20), friendships (questions 7, 8, and 9), behaviors (questions 10, 11, 14, 17, 18, and 21), generational/geographic background (questions 12 and 13), and attitudes (questions 15 and 19) of the American Indian culture, shown in Table 1. According to the developers of the measure, a summation of the scores of all twenty (20) items, with total scores ranging from twenty (20) to one hundred (100), was obtained and divided by the total number of items (20) to obtain a mean acculturation score. A mean acculturation score of less than (<3) indicates an individual that is of low acculturation, and a mean acculturation score of greater than (>3) indicates an individual that is highly acculturated. Trahan and Swaney (2004) added an additional question (#3 "What language do you understand?") to the N.A.A.S. that pertained to an individual's ability to understand a language. The question was included to measure the ability of speech recognition without the ability of fluently speaking the language, as bilingual individuals who were more successful in both the majority and the Native languages (reading, speaking, writing, listening) were a rarity (von Hapsburg & Pena, 2002). The factor analysis conducted on this measure also provided statistical insight concerning the item added by Trahan and Swaney (2004), discussed later.

The N.A.A.S. was patterned similarly to other Emic (i.e., culturally specific) acculturation scales, such as the Acculturation Rating Scale for Mexican Americans (ARSMA) and the Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA; Atkinson, Lowe, & Matthews,1995; Cuellar, Harris, & Jasso, 1980; Suinn and colleagues, as cited by Garrett & Pichette, 2000, p. 7). Garrett (1996) originally agreed

with LaFromboise, Trimble, and Mohatt (1993) that four acculturation classifications were viable with American Indians: traditional, marginal, bicultural, and assimilated. However, the marginal categorization was left out of the acculturation classifications in the N.A.A.S. as there is not a method to identify "marginal" individual scores. This omission is curious, as the authors of the N.A.A.S. concurred with Little Soldier's (1985) position, in that marginal American Indians would likely experience the most acculturative stress because of their rejection of beliefs and practices from both their culture of origin and the majority culture.

To obtain the overall mean cutoff scores and to infer content and construct validity, Garrett and Pichette (2000) employed the services of ten experts from various American Indian organizations in the Southeastern United States. The committee included experts from the Indian Health Service, the Native American Research and Training Center, Parent Connection, and the University of North Carolina at Pembroke. This committee represented a variation of tribal systems including: Paiute, Chippewa, Comanche, Creek, Eastern Band of Cherokee, Cherokee Nation, Crow and Lumbee (p. 7). The cut-off scores were established to categorize the results as traditional, bicultural, or assimilated. They achieved a Cronbach's reliability alpha coefficient of .91. The results of each participant were summed and divided by the total number of questions in the measure. The resulting score was rounded to the nearest whole number. Although this approach appeared logical, the act of rounding to the nearest whole number could artificially skew the results that indicated that more participants identified themselves as bicultural, when they fell more between traditional and bicultural. The same difficulty could occur between the bicultural and assimilated categories as well, in that those who

identified as “more acculturated,” but were closer to the bicultural end of the spectrum, would be falsely identified as “bicultural” when in fact, they identified as slightly more acculturated. This act of rounding up appears to have elevated the likelihood of “false positives” when identifying bicultural individuals on this scale and appeared to discount any information about the individual, as it omitted the quantitative and qualitative information between the scores of “2 (traditional),” “3 (bicultural),” and “4 (acculturated).” For example, an individual who scored a 50 on the N.A.A.S., when divided by the total items (21), produced an average of 2.4. Because this individual’s achieved score was below 2.5, the authors recommended rounding the number down to “2,” labeling this individual as “traditional.” Another example that elucidated this point was to take an individual who achieved a score of 73 on the N.A.A.S. Following the procedures given by the authors of the measure, this individual obtained an average score of 3.4. Again, because this individual’s score did not achieve the level required to round up to 4 and classified them as “acculturated,” their score was rounded down to a “3 (bicultural).” Thus, anyone who achieved scores that elicited averages of 2.5 to 3.4 was classified as “bicultural,” when in fact, they identified as more traditional or more acculturated. This classification flaw appeared to reduce the construct and face validity of the N.A.A.S., as well as altered the factor structure with this sample. This author hoped to elucidate inherent item or acculturation classification flaws in the N.A.A.S. in this study.

Garrett and Pichette (2000) devised and implemented the N.A.A.S. with American Indian Tribes in the Eastern United States. In general, American Indian Tribes all differ in their beliefs, traditions, and behaviors, especially between various regions of

the United States. Therefore, the first hypothesis was that the factor loadings of the Native American Acculturation Scale (N.A.A.S.) would not resemble the original factor structure identified by Garrett and Pichette (2000). Factor loadings and trends of validity were determined by utilizing maximum likelihood factor analysis with promax rotation, as this type of rotation allowed the factors to correlate, using the Statistical Package for Social Scientists 17.0 (SPSS 17.0). The factors were not confined to fit the original six factors found by Garrett and Pichette (2000) in order to determine the factor structure of the measure with this particular sample. Numerous validity indices were used to identify a trend of validity, since exploratory factor analysis was used in this study. The reliability of the N.A.A.S. was measured using Cronbach's alpha coefficient in SPSS.

**The Social, Attitudinal, Familial, and Environmental Acculturation Stress Scale (S.A.F.E.)** In measuring acculturative stress with this sample, the Social, Attitudinal, Familial, and Environmental Acculturation (S.A.F.E.) Scale was implemented (see Appendix B). The current form of the S.A.F.E. scale: a 24-item Likert scale introduced by Mena, Padilla, and Maldonado (1987), derived from a 60-item version composed by Padilla, Alvarez, and Lindholm (1986). The responses ranged from zero to five: 0 = not applicable, 1 = not stressful, and 5 = extremely stressful. The ranges of scores possible for the S.A.F.E. scale are from 0 (no acculturative stress) to 120 (very high acculturative stress). Usually, the median score for the sample is obtained, and is utilized as the cutoff point for scoring individual response sets as either low acculturation stress (below the median score), or higher acculturative stress (scores above the median score). For this study, the scores were kept as continuous data, as the scoring for this measure is quantitative in nature. Because the scores were continuous, meaning that a

higher scores on the measure reflected higher levels of experienced acculturative stress, it was of advantage to keep the data "as they were." Categorizing the data led to a loss of meaning within the data. Adding cut-off points to categories likely diluted the overall meaning and suggestive power the data may have possessed. Scores in this sample on the S.A.F.E. scale were taken at face value and reported as such to provide an initial estimation about acculturative stress experienced by the individuals.

However, it could also be argued that *not* possessing cut-off data might lead to confusion about experienced acculturative stress of the individual by the examiner. While extreme highs and lows of experienced acculturative stress have been perceived vis-à-vis the S.A.F.E. scale, scores that are not extreme might prove more difficult to delineate for the examiner. Despite this concern, this examiner kept the data from the S.A.F.E. scale as continuous data.

Higher scores reported on the S.A.F.E. scale indicated higher levels of acculturative stress. Dichotomizing the quantitative data would not have served the purposes of this study. For the purposes of this study, the 24-item S.A.F.E. scale, adjusted for use with Alaska Natives and American Indians by Glass (1996) was implemented to measure the validity and reliability of the S.A.F.E. scale with American Indian undergraduate students. Another purpose of this study was to examine the factor structure with this sample. Trahan (2007) obtained a reliability coefficient of .90 with a sample of 41 American Indian undergraduate students. However, the sample size from his study was not sufficient to infer reliability for the S.A.F.E. with his sample. Although the reliability coefficient was robust with a sample size of 41, it was the intent of this

study to determine the internal consistency with a larger sample of American Indian graduate and undergraduate students at The University of Montana.

Glass (1996) revised the S.A.F.E. acculturation scale, in the hopes of producing a scale that was more relevant to the American Indian beliefs and values, without affecting the overall validity of the items in the scale. Glass (1996) altered question 18, which stated, “loosening ties with one’s country,” as she believed that the context did not pertain to the American Indian/First Nations/Alaska Native populations and reworded the sentence to read, “loosening ties with one’s village/community” (p. 55). Glass omitted two of the questions from the original S.A.F.E. Acculturation Scale: “It bothers me that I have an accent” as she indicated that most Alaska Natives primarily speak their native language. She omitted the question concerning stress associated with an accent because she indicated Alaska Natives speak the English language with alternate rhythms and timing, which she did not consider as an accent. Glass also omitted the question, “It is difficult for me to ‘show off’ my family," as boasting is not considered appropriate in most American Indian families or in the Alaskan culture, as it places the individual above the family or the tribe and not part of the family or tribe.

However, for the purposes of this study, the questions omitted by Glass were re-incorporated to ensure the original validity and reliability coefficients and factor structure obtained by Mena, Padilla, and Maldonaldo (1987). This study also included Glass’s alteration to question number 18, “Loosening the ties with my village/tribal community was difficult,” as it pertained to American Indian samples more appropriately than the original question from Mena et al. (1987) which pertained to loosening ties with the individual’s country of origin.

The S.A.F.E. acculturation stress scale consists of four factors (e.g., social, attitudinal familial, and environment), as shown in Table 2 that measurs the level of acculturation with individuals of a minority group. The S.A.F.E. was developed to measure acculturation stress with the Hispanic population. The social factor incorporated items that pertained to the individual's perception of the quality of their immediate interpersonal relationships, encompassed difficulties in speaking and understanding languages, social skill effectiveness, establishing relationships, and feelings of belonging. Three items (10, 12, and 13) made up the social factor. The attitudinal factor consisted of items the individual experienced as a result of physical separation from their families, friends, and cultures of origin. It consisted of four items (8, 18, 19, and 24). The familial factor consisted of items three, four, and six; these items pertained to the various conflicts between values, expectations, and aspirations of the individuals, and their families. Finally, the environmental factor contained items that pertained to the individual's perceptions of both covert and overt acts of racism, perceived roadblocks set by the majority culture concerning basic rights of citizenship, and the feelings experienced by the individual elicited by the perceived barriers for inclusion in the majority culture. Items 1, 2, 5, 7, 9, 11, 14, 15, 16, 17, 20, 21, and 23 make up the environmental factor.

The scores possible for the S.A.F.E. scale ranged from zero (no acculturative stress) to 120 (very high acculturative stress). Usually, the median score for the sample was obtained, and was utilized as the cut-off point for scoring individual response sets as low acculturation stress (below the median score), or higher acculturative stress (scores above the median score). For this study, the scores were kept as continuous data, as the scoring for this measure is quantitative in nature.

The S.A.F.E. Acculturation Scale originally examined Hispanics living in the United States. Fuertes and Westbrook (1996) examined the reliability and validity of the scale with 141 (57% female, 43% male) Hispanic students at a predominantly Caucasian university in the northeastern United States. They utilized the 24-item S.A.F.E. scale (Mena et al. 1987) in an attempt to re-examine the previous reliability coefficient of .89 found with Asian American and international students by Mena et al. (1987). Fuertes and Westbrook also wished to study possible effects of gender, generational status, and socioeconomic status on reported levels of acculturative stress. They examined the factor structure of the S.A.F.E. Acculturation Stress Scale utilizing principal components analysis and the varimax rotation method. Fuertes and Westbrook also conducted an exploratory factor analysis (EFA) as this type of analysis had not been conducted previously with the 24-item scale.

From their analysis, they found a four-factor structure to the S.A.F.E. scale (social, attitudinal, familial, and environmental) which together accounted for approximately 55% of the variance. The factor that displayed the highest amount of variance was the environmental factor, which accounted for 31% of the variance on the S.A.F.E. scale, with the attitudinal factor accounting for 9%, the social factor accounting for 8%, and the familial factor explaining 6% of the variance. As evidenced in Table 2, 10 items loaded on the environmental factor, four items loaded on both the attitudinal and social factors, and three factors loaded on the familial factor. It is of interest that they used varimax rotation, as varimax rotation derives from the orthogonal method, which predicates that the factors are independent from one another. Since the factors from the

S.A.F.E. are intended to measure acculturation stress, it seems that the factors are related to one another.

Fuertes and Westbrook (1996) also found that 21 of the total 24 items displayed a reliability coefficient of .89, which mirrored the findings from Mena et al. (1987). When they examined the reliability coefficients of all four factors, they found that the environmental factor exhibited a coefficient of .88, the attitudinal factor exhibited a coefficient of .73, the social factor displayed a coefficient of .71, and the familial factor exhibited a coefficient of .70, respectively.

An additional study by Kim and Omizo (2006) utilized the S.A.F.E. acculturation stress scale in order to examine Asian American college students' behavioral *acculturation* processes to the mainstream, Western culture of the United States. They also evaluated the students' behavioral *enculturation* processes to their Asian cultural practices and beliefs and both processes interaction with cognitive flexibility, self-efficacy, collective self-esteem (evaluation of self as a part of a group), acculturative stress, and willingness to seek professional psychological help. Kim and Omizo (2006) indicated that their study elicited a coefficient alpha of .93 and reported the validity of the S.A.F.E. by the correlations obtained with the age of the individual when immigrated to the U.S., their generation status, and by the level of loyalty to their culture of origin. They stated the correlation of the S.A.F.E. scale with these factors were in the direction they expected. Kim and Omizo (2006) found a positive correlation between reported acculturation stress scores from the S.A.F.E. scale and the individuals' ages at the time they immigrated. They also found a positive correlation between S.A.F.E. scores and the individuals' loyalty to their culture of origin. They noted that older immigrants who are

more loyal to their native culture, or more traditional, reported higher levels of acculturative stress on the S.A.F.E. scale.

The S.A.F.E. attained similar internal consistency coefficients throughout the above-named studies, lending support to the reliability of the S.A.F.E. in measuring acculturation stress with the Hispanic population. The Social, Attitudinal, Familial, and Environmental Acculturation Stress Scale (S.A.F.E.) was developed for use with Hispanic college students. Other researchers have examined the factor structure with various ethnic samples, except an American Indian sample. Therefore, the second hypothesis was that the factor loadings of the Social, Attitudinal, Familial, and Environmental Acculturation Stress Scale (S.A.F.E.) would not resemble the original factor structure found by Mena, Padilla, and Maldonaldo (1987), using factor analysis with this sample of American Indian undergraduate and graduate college students. Factor loadings and validity were determined by utilizing exploratory factor analysis, more specifically, maximum likelihood with promax rotation, to determine the factor structure for the S.A.F.E. with this sample. Fuertes and Westbrook (1996) conducted a principal components analysis (PCA) with an orthogonal, varimax rotation. However, researchers have argued that PCA was not a true form of factor analysis, did not examine the underlying factor structure of the instrument, and did not separate the shared and unique variance (Costello & Osborne, 2005). Costello and Osborne (2005) also proposed that orthogonal rotation overlooked useful information from the analysis, because of the operational assumption that the factors were independent from one another.

The 24 items of the S.A.F.E. were entered as variables for the exploratory factor analysis in S.P.S.S., without confining the results to four factors, to examine the factor

loadings of the items with this sample. The examiner expected differences in the factor loadings as the S.A.F.E. was developed for Hispanic college students. The factor expected to differ the most with this sample of American Indian college students was the attitudinal factor, as most of the sample used in the development of the S.A.F.E. were first or second generation Hispanic immigrants. These individuals were "voluntary immigrants" (Ogbu & Simons, 1998). Their attitudes about the majority culture differed from an American Indian sample, who were considered "involuntary immigrants," (Ogbu & Simons, 1998) in that the voluntary immigrants were more optimistic about acquiring a new language and practices for a potentially better life than their homeland. Alternately, American Indians were subject to multi-generational prejudice, racism, and oppression, which exhibited less optimism and more mistrust toward the dominant culture. It was expected that the attitude difference would produce different item loadings for the attitudinal factor of the S.A.F.E. The reliability of the S.A.F.E. was also determined using Cronbach's alpha coefficient in SPSS. This study also wished to infer content validity with an American Indian sample by determining the item-to-factor ratio, $\chi^2$/df to determine the fit of model to the data.

The third and final hypothesis was that the N.A.A.S. and the S.A.F.E. would possess a significant, negative relationship. This hypothesis was based on findings by this author in a prior, unpublished study in 2007. The strength and direction of the relationship was measured by conducting a bivariate correlation analysis of participants' scores from both the N.A.A.S. and the S.A.F.E.

**Procedure**

The primary investigator recruited the participants, via e-mail, with the assistance of the office manager of the American Indian Support Services (AISS) at The University of Montana. The e-mail (see Appendix D for an example of the letter) contained an electronic link to a protected, online survey site (SurveyMonkey.com), when they clicked the link, were given information concerning the study, any perceived effects from the study, the benefits and/or harmful effects expected from participating in this study, and given an electronic consent form. Informed consent was obtained electronically (by clicking a box with the descriptor "I consent to participate in this study"). The participants completed the general questionnaire form, the 24-item S.A.F.E. Acculturation Stress Scale (Mena, Padilla, & Maldonaldo, 1987, modified by Glass, 1996), the 21-item Native American Acculturation Scale (Garrett & Pichette, 2000, modified by Trahan & Swaney, 2004), and a form that asked only for their primary e-mail address (for prize-winning notification) in exchange for an entry for one of six (6) $25 Visa gift cards. The investigator only contacted the six (6) drawn winners via their supplied e-mail addresses. The investigator asked the winning participants to provide their primary residential address in order to receive their $25 gift card. The investigator destroyed the listing of winners' e-mail addresses, after he contacted them, to protect the winning participants' privacy. The primary investigator did not give experimental credits in this study, due to the logistical difficulty in providing signatory verification of study participation. The participant's results were entered into the Statistical Package for Social Scientists version 17.0 (SPSS 17.0), using maximum likelihood analysis and

promax rotation to obtain the factor structures of the N.A.A.S. and the S.A.F.E. with this sample.

The investigator also collected data in the winter of 2011, via the American Indian Student Services (AISS) listserv from The University of Montana. The same recruitment e-mail (see Appendix D) was sent to prospective American Indian undergraduate and graduate students at the university, with the assistance of the AISS office manager. Twenty-five participants replied to the first issuance of the recruitment e-mail for the second collection of data. The investigator sent another recruitment e-mail two weeks later, which elicited an additional 14 responses. Lastly, the investigator sent a third issuance of the recruitment letter two weeks later, which elicited 11 responses. However, seven participants from the 2011 data collection, gave informed consent to participate in the study, but did not complete any of the electronic surveys. When the data collections were combined, one hundred (100) participants had given informed consent and completed the surveys.

**Analysis**

Using SPSS 17.0, the investigator computed the means and standard deviations for all of the completed measures: general questionnaire, the NAAS, the S.A.F.E. Acculturation Stress Scale to obtain the median scores of each measure and to examine the variability of scores for all three measures. The investigator conducted an exploratory factor analysis (EFA), using maximum likelihood estimation with an oblique, promax rotation for this sample. Exploratory factor analysis provided an avenue to distinguish the number of factors and the item factor loadings from the sample data. This type of analysis appears prudent for the purpose of this study, as this was a specialized sample of

American Indian college students and not representative of all American Indians. The investigator chose an oblique, promax rotation because a promax rotation permits correlations between the factors. The maximum likelihood estimation assists to determine the item loadings into each factor and determine the strength of the item loadings of each instrument. The investigator obtained the reliability coefficients by computing Cronbach's Alpha for both the N.A.A.S. and the S.A.F.E. using SPSS 17.0.

Since SPSS did not elicit a fit index, the researcher interpreted the direction of fit by examining a chi-square ($\chi^2$) coefficient. The chi-square from the factor analysis determined whether the observed data from the sample of American Indian undergraduate and graduate students approximated the measure established for the population model. To identify a good fit, the chi-square coefficient must not have reached a level of significance ($p \leq .05$). Chi-square was most affected by extreme sample sizes (very large or very small). The sample size from this study ($N = 100$) was appropriate because it would not have greatly influenced the chi-square coefficient. SPSS 17.0 did not provide error estimations when determining chi-squre ($\chi^2$) and the goodness-of-fit between the measure and the data, therefore, the $\chi^2$/df ratio was used. The $\chi^2$/df ratio was an adjunct to chi-square that provided insight about model fit to the data. This ratio reduced the effect of sample size when incorporating the degrees of freedom, giving an unbiased estimation of the fit of the data. Hatcher (1994) identified a ratio of two (2) or less as indicating good fit between the model and the data. The investigator calculated the $\chi^2$/df ratio manually for this study.

Overdetermination of factors is another goodness-of-fit adjunct utilized when no error of estimation was available (Comrey & Lee, 1992). An overdetermination quotient

was found by dividing the number of items in the measure by the number of factors of the measure. A quotient of five or more (>5) indicated a good fit.

When interpreting the goodness-of-fit index, the researcher examined how well the observed sample data represents the expected value from the population. For this study, a chi-square value that reached a significance level below .05 (<.05) indicated that the measure did not fit the data obtained from this sample and did not fit the data expected from the population. A finding above the significance level of .05 (>.05) indicated that the measure(s) fit the data obtained from this sample.

The investigator conducted a correlation analysis between the constructs of acculturation and acculturation stress. Because acculturation stress was derived from the theory of acculturation, a high relationship was expected. This investigator utilized Pearson's (*r*) correlation analysis to identify the strength and direction of the relationship between the N.A.A.S. and the S.A.F.E. The consensus of researchers (including this author) was that a strong, negative correlation was expected between the constructs of acculturation and acculturation stress, especially with individuals that identify as "traditional or separatists" (Berry, Kim, Power, & Young, 1989). Individuals with this identification likely acknowledged more acculturative stress, as they attempted to adhere to the practices of their culture of origin. Alternately, individuals who identified as bicultural or integrated, would have reported less acculturative stress, as they possessed more comfort transitioning between both their culture of origin and the majority culture (LaFromboise, Coleman, & Gerton, 1993). Additionally, individuals who identified as acculturated, or more attuned to the cultural practices and beliefs of the majority culture, (higher scores on acculturation measure) likely reported lower acculturative stress.

Lastly, individuals who identified as marginalized (Berry, Kim, Power, & Young, 1989) acknowledged more acculturative stress, as they have rejected the practices and beliefs of their own culture, as and those of the majority culture. However, the N.A.A.S. did not distinguish marginalized individuals. The N.A.A.S. scoring structure identified traditional, bicultural, and acculturated scores. This was also an implicit weakness of the N.A.A.S.; it identified only three of the four categories established by the fourfold theory of acculturation. The omission of one category of the fourfold theory likely affected the validity of the acculturation measure, making it questionable for use with American Indian samples.

When interpreting the relationship between two variables, the more the correlation coefficient approaches one, the stronger the relationship between the two variables. The author hypothesized that the N.A.A.S. and the S.A.F.E. possessed a strong, negative relationship between the N.A.A.S. and the S.A.F.E. It was hypothesized that the strength of the relationship between the two measures was high (.5 or above); which indicated that participants who reported higher acculturation scores would exhibit lower acculturation stress scores than participants who reported lower acculturation scores.

# Results

## Demographics

Of the 100 participants who completed the surveys in this pilot study: 32 are male, 67 are female, and one participant identified as "other." Fifteen participants are enrolled in their freshman year of college, 19 in their sophomore year, 17 in their junior year, and 21 are enrolled in their senior year. Fifteen participants are enrolled in a master's level program. Lastly, 12 participants are enrolled in a doctoral program at The University of Montana. As seen in Table 3, the mean age of the participants is 29 years of age, with a standard deviation of 8.7, a median of 27, and a range from 18 – 61 years.

Seventy-five participants, or 75%, are enrolled in various Tribes from the Northern Plains, villages from Alaska, and Tribes from the Southwest region of the United States. Eighty-eight (88%) percent of the 25 participants who are not enrolled in a federally recognized tribe ($n$ = 22), identify as a "first-generation descendent" (the participant is not enrolled, but one or both of their parents are enrolled). Eight percent of the participants not enrolled in a federally recognized tribe, identify as a "second-generation descendent" ($n$ = 2), meaning neither of their parents were enrolled in a Tribe, but one or more of their grandparents are. Lastly, four percent of the participants ($n$ = 1) identify as a third-generation descendent (the participant is not enrolled, their parents are not enrolled, their grandparents are not enrolled, and one or more of the participant's great-grandparents were enrolled).

The mean number of years spent on a reservation is 12.9 years, with a standard deviation of 11, a median of 13.5, and a range of 0 – 43 years. Alternatively, the mean number of years spent off-reservation is 16, with a standard deviation of 12.2, a median

of 14.5 years, and a range of 0 – 50 years, respectively. The standard deviations for years spent on and off an American Indian reservation indicate moderate variability between the participants in this study.

**Analysis of the NAAS**

The mean Native American Acculturation Scale (N.A.A.S.) score is 65.1 (out of a possible 110), a median score of 64, a standard deviation of 10.9, and a range of 36 - 87. While it appears that the participants in this study land in the "bicultural realm" of the measure (by dividing the total score by twenty-one; the total number of items), there also appears to be profound variability between the participants' scores. While the N.A.A.S. did show robust reliability in obtaining a Cronbach's Alpha coefficient of .84 (see Table 4), the N.A.A.S. did not appear to fit the data obtained from this sample. Table 5 shows the obtained fit index ($\chi^2$) for the N.A.A.S., which was 185.66 ($p$ = .000, df = 115), which infers the N.A.A.S. does not fit the data from this pilot sample of American Indian students. This statistic is used to show a trend of possible fit with this pilot sample, since this study is an exploratory analysis.

Exploratory factor analysis (EFA), with promax rotation of the N.A.A.S. indicates that the items load into four factors (i.e., language, identity, friendships, and behaviors of American Indian culture) compared with the six factors specified in the original model from Garrett and Pichette (2000), as indicated in Table 6. Only one item loads into the fifth factor, "Generational/Geographic Backgrounds" from this analysis: item six, "My family did not want me to move away but I wanted to (.97). Despite this high loading value, the "Generational/Geographic Backgrounds" factor does not possess at least three strongly loaded items needed to establish a factor (Costello & Osborne,

2005). Therefore, the N.A.A.S. only loads four factors with this sample of American Indian university students from the Northwest United States.

In this analysis, six items load into the "Native American Language" factor: item two, "What language do you prefer?" (.61); item 10, "What music do you prefer?" (.83); item 11, "What movies do you prefer?" (.59); item 15, "What foods do you prefer?" (.65); item 19, "How much pride do you have in Native American culture and Heritage?" (.45); and item 21, "Do you participate in Native American traditions, ceremonies, occasions, and so on?" (.81). The eigenvalue for the "Native American Language" factor is 6.82 and accounts for approximately 32 percent of the total variance of the N.A.A.S.

The second factor, "Identity," loaded five items in this analysis: item one, "What language can you speak?" (.69); item 3, "What language do you understand?" (.65); item 16, "In what language to you think?" (.70), item 17, "Do you…(write language)" (.95); and item 18, "Do you…(read language)" (.91). Item 3, "What language do you understand?," (.65) was introduced by Trahan and Swaney (2004). The premise for the inclusion of this item was that some individuals may not fluently speak the language, but could understand words spoken to them (von Hapsburg & Pena, 2002). The eigenvalue for this factor is 3.09 and the "Native American Identity" factor explains approximately fifteen percent (14.7%) of the total variance of the N.A.A.S.

Five items load into the third factor, "Native American Friendships," from this analysis: Item 7, "What was the ethnic origin of friends you had as a child up to age 6?" (.73); item 8, "What was the ethnic origin of friends you had as a child up to age 6 to 18?" (.74); item 12, "Where were you born?" (.60); item 13, "Where were you born?" (.60); item 13, "Where were you raised?" (.87); and item 14, "What contact have you had

with Native American communities?" (.60). The eigenvalue for the "Native American Friendships" factor is 1.61 and accounts for approximately eight percent (7.7%) of the total variance of the N.A.A.S.

Four items load into the fourth factor, "Behaviors:" item 4, "How do you identify yourself?" (.65); item 5, "Which identification does (did) your mother use?" (.64); item nine, "Who do you associate now in your community?" (.56); and item 20, "Because of my ethnic background, I felt that others often did not ask me to take part in their activities" (.66). The eigenvalue for this factor is 1.45, which accounts for approximately seven percent (6.9%) of the total variance of the N.A.A.S.

Table 7 shows the ranges of communalities and categorization of the communalities of the items in the N.A.A.S. with this sample of American Indian undergraduate and graduate students. The communalities range from .42 - .86. The items display some variability, but 13 of the 21 items from the N.A.A.S. achieve high communalities (>.60) with this sample.

Other fit adjuncts are used to show a possible trend of fit of the N.A.A.S. with the data from this sample, despite this being an exploratory analysis. One of the two fit adjuncts indicates a trend of fit of the N.A.A.S. with this pilot sample. The N.A.A.S. attains an item to factor ratio (*p:r*) of 21:5, or quotient of 4.2. This quotient was below the threshold associated with fit to the data ($\geq 5$) (Comrey & Lee, 1992; MacCallum et al., 1999). The N.A.A.S. has a $\chi^2$/df quotient of 1.61, which is below the threshold of two that is suggested by Hatcher (1994), which indicates a trend of fit to the data. Again, these adjuncts are to show a trend of fit with the sample, as this analysis is an exploratory factor analysis and not a confirmatory factor analysis.

**Analysis of the S.A.F.E.**

The mean Social, Attitudinal, Familial, and Environmental Acculturation Stress Scale (S.A.F.E.) score is 63.7 (out of a possible total of 120), a median score of 61, a standard deviation of 21.8, and a range of 0 – 120, as shown on Table 3. While it appears that the participants in this study report a moderate amount of acculturative stress, there also appears to be a profound variability between the participants' scores on the S.A.F.E. The S.A.F.E. did appear to show a trend of fit with the data from this sample, as Table 8 indicates. The chi-square fit index from maximum likelihood analysis ($\chi^2$) is 175.10 ($p$ = .057, df = 147). The fit index is utilized to infer a trend of fit with this pilot sample. The S.A.F.E. also possesses a high reliability with a Cronbach's Alpha of .91. Table 9 compares the reliability coefficient in this sample with earlier studies of the S.A.F.E. with different ethnic samples.

In conducting a maximum likelihood analysis with promax rotation, the 24 items from the Social, Attitudinal, Familial, and Environmental Acculturation Stress Scale (S.A.F.E.) load into five factors with this sample. The original analysis by Mena et al. (1987) indicates four factors. The exploratory factor analysis with this sample indicates that the items loaded most heavily into the familial stressors factor, with six total items (items 1, 2, 3, 9, 11, and 15), respectfully. The factor structure of the S.A.F.E. found with this pilot sample is shown in Table 10.

Five items load into the "Social" factor: item 14, "I often felt that people were actively trying to stop me from advancing" (.81); item 16, "I often felt ignored by people who were supposed to assist me" (.73); item 17, "Because I was different I did not get enough credit for the work that I did" (.73); item 20, "Because of my ethnic background,

I felt that others often did not ask me to take part in their activities" (.76); and item 21, "People looked down upon me if I practiced the customs of my culture" (.66). This factor possesses an eigenvalue of 8.38 and accounts for approximately 35 percent (34.9%) of the total variance for the S.A.F.E. with this pilot sample.

Five items load into the "Attitudinal" factor of the S.A.F.E. from this pilot sample: item 4, "Close family members and I had conflicting expectations about my future" (.61); item 8, "It bothered me that I could not be with my family" (.73); item 12, "I didn't feel at home" (.69); item 18, "Loosening the ties with my Village / Tribal community was difficult" (.89); and item 19, "I often thought about my cultural background" (.52). This factor shows an eigenvalue of 2.34 and accounts for roughly 10 percent (9.7%) of the total variance for the S.A.F.E. with this pilot sample.

Six items load into the "Familial Stressors" factor in this analysis: item 1, "I felt uncomfortable when others put down people of my ethnic background" (.58); item 2, "I had more things blocking my success than most people" (.69); item 3, "It bothered me that family members I was close to did not understand my different values" (.64); item 9, "In looking for a good job, I sometimes felt that my ethnicity was a limitation" (.60); item 11, "Many people had stereotypes about my culture or ethnic group and treated me as if they were true" (.65); and item 15, "It bothered me when people from a different culture pressured me to be like them" (.69). This third factor shows an eigenvalue of 1.56 and accounted for approximately 7 percent (6.5%) of the total variance of the S.A.F.E. with this pilot sample of American Indian undergraduate and graduate students.

Four items loaded into the "Environmental Stressors" factor: item 5, "It was hard to express to my friends how I really feel" (.69); item 6, "My family did not want me to

move away, but I wanted to" (.54); item 10, I didn't have many close friends" (.54); and item 24, "It is difficult for me to 'show off' to my family" (.48). This factor shows an eigenvalue of 1.36 and accounts for approximately six percent (5.7%) of the total variance explained for the S.A.F.E.

This exploratory analysis initially produces two additional factors. However, one "factor" has a solitary item and was omitted when using the factor guidelines from Costello and Osborne (2005) . The fifth factor loads three items, which follows the guidelines from Costello and Osborne (2005): item 13, "People thought I was unsociable when in fact, I had trouble talking in English" (.72); item 22, "I had trouble understanding others when they spoke" (.70); and item 23, "It bothers me that I have an accent" (.76). This additional factor achieves an eigenvalue of 1.18 and accounts for roughly five percent (4.9%) of the total variance for the S.A.F.E. with this pilot sample.

The sixth factor loads a solitary item: item 7, "It bothered me to think that so many people used drugs" (.27). Therefore, given the guidelines set by Costello and Osborne (2005), this one item is not considered a factor, as it does not contain at least three, strongly loading items (.50 and above).

Communalities are utilized to determine the strength of item loadings. Table 11 shows the ranges of communalities and categorization of the items of the S.A.F.E. with this sample of American Indian undergraduate and graduate students. The communalities range from .29 - .73. The items from the S.A.F.E. display moderate variability. Twelve of the 24 items from the S.A.F.E. have high communalities (>.60) in this analysis. Conversely, only five (5) items show low communalities of .48 or lower.

The *p:r* ratio is utilized as a fit adjunct to indicate a trend of the fit of the S.A.F.E. with the data from this pilot sample, as this is an exploratory factor analysis. The S.A.F.E. possesses a *p:r* ratio of 24 items and six factors, or 24:6. This ratio produces a quotient of four items per factor, which is below the recommended ratio of 5:1 (Comrey & Lee, 1992; Hatcher, 1994; and MacCallum et al., 1999). The S.A.F.E. shows a $\chi^2$/df quotient of 1.19, which is below the quotient of two Hatcher (1994) recommends, which indicates a trend of fit to the data from this pilot sample.

A significant, negative relationship is present, when utilizing a bivariate correlation analysis for the total scores of the N.A.A.S. and the S.A.F.E. ($r$ = -.27, $p$ = .006). Therefore, lower scores on the N.A.A.S. show a strong, inverse relationship with higher scores on the S.A.F.E. This shows that American Indian and Alaska Native undergraduate and graduate students who score lower on the N.A.A.S. (lower acculturation) score higher in acculturative stress, from the Social, Attitudinal, Familial, and Environmental (S.A.F.E.) acculturation stress scale.

## Discussion

Despite following guidelines in utilizing focus groups of the target population (Hennessy & John, 1995; Knafl, Deatrick, Gallo, Holcombe, Bakitas, Dixon, & Grey, 2007; Vogt, King, & King, 2004) and utilizing panels of cultural and clinical experts (Polit, Beck, & Owen, 2007), the N.A.A.S. items loaded differently with this pilot sample of American Indian undergraduate and graduate students. This analysis produced fewer factors than what Garrett and Pichette (2000) posited in their analysis. The N.A.A.S. obtained robust reliability, but did not appear to show a trend of fit to the data from this sample of American Indian undergraduate and graduate students.

The results of this analysis, however, seemed promising when utilizing three adjuncts to factor loading to infer a direction of fit with this sample: the chi-square/degrees of freedom ($\chi^2$/df) quotient, item communalities, and overdetermination of factors. These adjuncts were used because this pilot sample only achieved one hundred participants, which likely elicited statistics not likely seen with a sample size of three or four hundred participants. The adjuncts were also used to show an initial trend of fit, as this was an exploratory factor analysis, not a confirmatory factor analysis study. While this pilot study and the study from Garrett and Pichette (2000) both utilized American Indian samples, age and intertribal differences between this sample and Garrett and Pichette's (2000) sample warranted an exploratory factor analysis, rather than an confirmatory analysis. Garrett and Pichette utilized a sample of 139 American Indian high school students from the eastern portion of the United States. This sample consisted of American Indian graduate and undergraduate students over the age of 18. The age, geographical, and Tribal differences between the two samples would likely produce

alternate results from factor analysis, as immigrant adolescents were more likely to change their cultural belief systems more readily than adults (Nguyen & Williams, 1989; Phinney, Ong, & Madden, 2000). Jensen, Arnett, and McKenzie (2011) discussed differences in cultural identity formation with adolescents, young adults, and emerging adults. They defined emerging adults as possessing differences from adolescents geographically, behaviorally, and psychologically. Given this information, it appeared plausible that the factor structure for the N.A.A.S. with this sample would differ from the original sample of American Indian high school students by Garrett and Pichette (2000).

Some used the $\chi^2$/df quotient as an adjunct to factor analysis when the construct validity of a measure was examined. This quotient was utilized to infer a possible trend of fit with this pilot sample, as this was an exploratory factor analysis and not a confirmatory analysis. According to Hatcher (1994), an $\chi^2$/df quotient lower than two (2), indicated a good fit between the model and the data. The $\chi^2$/df quotient is thought to be an initial descriptor of validity in that dividing the chi-square coefficient ($\chi^2$) by the degrees of freedom (df) reduces the standard error of measurement. The N.A.A.S. achieved a $\chi^2$/df quotient of 1.61, which according to Hatcher (1994), should have lent support for the N.A.A.S. fitting the data of this sample, as the ratio was lower than two (2). The remaining adjuncts used to infer validity (item communalities and factor overdetermination) are discussed later in this paper.

The N.A.A.S. did not show a trend to fit the data from this pilot sample. The first reason might have related to the controversial theoretical components of the fourfold theory of acculturation proposed by Berry (1980). Opponents have stated that the theory is culturally biased, meaning the fourfold theory implied that the most desirable

acculturation strategies would be assimilation to the dominant culture (Rudmin & Ahmadzadeh, 2001; Smith, 2001) and that the fourfold theory omitted 12 other acculturation possibilities when using Boolean logic (Rudmin, 2003). However, Berry (2009) argued that such implications were contextually misinterpreted and derived from biased opinions concerning the model. While Berry's arguments were salient in addressing the argument of bias toward the dominant culture, he did not, however, address the argument of 12 additional acculturation combinations presented by Rudmin (2003). The omitted combinations included the union of both cultures and the option of the individual choosing one culture, other culture, or different combinations of both cultures. The three identifications proposed by Garrett and Pichette (2000) were difficult to measure. The N.A.A.S. also did not account for the classification of a marginalized individual. The N.A.A.S. relied on a continuum of cultural affiliations and did not account for other acculturation possibilities, such as the null identification, or not identifying with either culture. Therefore, information was missed due to the lack of a marginalized classification. The N.A.A.S. did not include a choice that identified a marginalized individual. Maybe an additional choice of "neither" could have elicited such information. It would be likely, however, that the marginalized classification would be difficult to identify due to the scoring protocol in the N.A.A.S. Because the affiliations were categorical and qualitative, it was difficult to interpret the conversion of quantitative information into qualitative categories of cultural affiliation (traditional, bicultural, and acculturated). Classifying an individual as marginalized would likely prove as difficult, as the score would need to be zero. When this information was converted, much information was lost. Also, rounding the participants' results to the

most appropriate whole number created difficulty identifying accurate acculturation status. This difficulty is also explained later in the discussion.

Although this study achieved a sufficient number of participants to establish stable statistics, it is likely a larger sample size might have elucidated even more statistical information about the N.A.A.S. Many researchers have proposed the minimum sample sizes needed to reduce the standard error in factor analysis at one hundred (100) participants, but still warned that this number would not supply the statistical information higher *N*'s would provide (Gorsuch, 1983). Other researchers have proposed even larger sample sizes for acquiring robust statistical findings in factor analysis. For instance, Guilford (1954) believed the appropriate sample size was 200 participants. Comrey and Lee (1992) developed a scale that identified different sample sizes and how well they performed in factor analysis. They proposed that any sample size over 500 was optimal, while a sample size below 300 was least desirable. The consensus of researchers who posited larger sample sizes was that the larger sample sizes decreased the standard error inherent in the factor loading correlation coefficients. As the sample size for this study ($N = 100$) achieved the number suggested by some researchers (Gorsuch, 1983), it was still smaller than what other researchers considered most optimal for factor analysis (Comrey & Lee, 1992; Guilford, 1954). Therefore, this analysis should be considered a pilot study (McLeod, 2007). Because of sample size obtained in this study ($n = 100$), the chi-square/degrees of freedom ($\chi^2$/df) quotient, item communalities, and factor overdetermination of the both instruments were used as adjuncts to fit to show a trend from this exploratory analysis. These adjuncts provided additional information about the performances of both instruments with this sample.

MacCallum, Widaman, Zhang, and Hong (1999) proposed that communalities, or the variance accounted for by common factors of the items analyzed, showed a trend of the quality of the factor analysis. They added that the communalities elicited the trend even when the *n* was not large enough to infer the statistical stability of the solution. MacCallum et al. (1999) classified levels of communalities for the individual items: high (.6 - .8) and low (.2 - .4). They established a definition of an excessive, or "wide" range of items analyzed (.2 - .8) (p 91). They proposed that too wide a range of item communalities indicated items that possessed little relationship with one another. As displayed in Table 7, the initial communalities for the N.A.A.S. ranged from .42 to .86, which showed relationships between the items in the instrument. Despite the moderate variability of communalities in the items of the N.A.A.S., it did not fit the data obtained from this sample.

While MacCallum et al. (1999) determined the classifications of low and high communalities, they did not specify what the communality of .50 - .59 meant. Therefore, this researcher classified this communality range as "moderate," as this range fell between what MacCallum et al. (1999) defined as "low" or "high" communalities (shown in Table 7). Thirteen items classified as having "high" communality: item 1 (.69), item 3 (.70), item 5 (.60), item 6 (.60), item 7 (.62), item 8 (.66), item 10 (.63), item 13 (.65), item 16 (.65), item 17 (.84), item 18 (.86), item 20 (.64), and item 21 (.70). Conversely, five items from the N.A.A.S. classified as "moderate" communalities: item 2 (.58), item 4 (.57), item 11 (.53), item 12 (.52), and item 15 (.59). Only three items from the N.A.A.S. possessed "low" communality: item 9 (.44), item 14 (.42), and item 19 (.43). There existed only a moderate amount of variability (.42 - .86) between the communalities in

this analysis when compared to MacCallum et al.'s (1999) classification of a "wide" variability of communalities (.2 - .8). Based on the information, one could erroneously conclude a presence of lower sampling error and possible greater fit of the measure to the data. However, the N.A.A.S. did not fit the data from this sample ($p$ =.000). Perhaps the reason for this finding was that only four (4) items attained communalities higher than .70, considered high. Perhaps more items with high communalities equals better fit to the data. The N.A.A.S. did not appear to show content or construct validity with this sample. However, the N.A.A.S. displayed high internal consistency (.84), as shown in Table 4. This finding mirrored results from an unpublished study by Trahan (2007), which he found an alpha of .87. However, high internal consistency of a measure means little without collaborative validity. The results from this analysis showed that the N.A.A.S. measured this sample in a reliable, invalid manner.

Overdetermination was an adjunct to more commonly used validity indices which SPSS did not offer. Overdetermination was often used when the sample size was in the lower bound of acceptable sample sizes for factor analysis. Comrey and Lee (1992) hypothesized that the quality of the factor analysis solution was affected by the level of overdetermination. They defined overdetermination as the degree each factor contained a sufficient number of variables (items). Thus, if each of the factors of a measure had a sufficient amount of variables (items), then an exuberant $N$ is not necessary. Comrey and Lee (1992) discussed the concept of overdetermination and suggested that each factor should load at least five variables, or items, in order to negate the need for a large $N$ when conducting factor analysis. Overdetermination also appeared to affect sampling error, in that factors which achieved high overdetermination (over five items loaded into the

factor), reduced the possible error in sampling the population (Arrindell & van der Ende, 1985; Barrett & Kline, 1981, as cited by MacCullum et al., 1999). MacCallum et al. (1999) and Comrey and Lee (1992) discussed the most common way to determine the overdetermination of an instrument. They discussed determining the ratio of items, they defined as *p*, and the number of factors, known as *r*. A overdetermination ratio (*p:r*) of 5:1, or a quotient (dividing the total number of items by the number of factors) of 5 or more was most desirable. When this process was used with the number of items and factors proposed by Garrett and Pichette (2000), the N.A.A.S. possessed a *p:r* ratio of 21items, to five factors (language, identity, friendships, behaviors, generational/ geographical backgrounds, and attitudes), or 21:5. A quotient of 4.2 items per factor for the N.A.A.S. was found from this analysis. The N.A.A.S. did not achieve overdetermination when following the guidelines proposed by MacCallum et al. (1999) and Comrey and Lee (1992). The items of the N.A.A.S. loaded into five factors in this analysis. Therefore, the N.A.A.S. did not achieve overdetermination because it possessed a *p:r ratio* of 21:5, which gave the measure 4.2 items per factor. Preliminary adjunct fit indicators, used to infer fit, indicated the N.A.A.S. did not fit the data from this pilot sample. One difficulty with overdetermination is that it did not account for the validity, or invalidity, of the instrument to measure the construct of acculturation. Overdetermination, also did not consider the cultural relevancy of the items in the N.A.A.S. The items may not have related culturally to the sample examined, but as long as the measure contained the necessary ratio for overdetermination of 5:1 or more, the instrument would have appeared valid to the researcher. While proposed as a suitable primary indicator of fit, the overdeterimination ratio or quotient was primarily a

computation. It did not indicate how the item measured the theory of acculturation with that sample. For instance, a researcher could have developed a measure that possessed 100 items that fell into five factors which examined American Indian cultural practices: such as, the importance of extended family for interdependent support systems that accounted for psychological resiliency. Initially, this measure would have appeared to indicate a good fit because of the 20:1 item-to-factor ratio. However, neither content, nor cultural validity of the instrument could have been established by computing a ratio or quotient. Especially if some items had been based upon Western societal practices, such as striving for independence and autonomy, without culturally relevant content in the items of the instrument.

Perhaps another reason for the differing factor structure and lack of inferred fit of the N.A.A.S. was due to the variability in the ages of participants in this sample. The standard deviation of the age of the participants was greater than ten years (10.1). The ages of the participants ranged from 18 – 61 years of age, with nine participants over 45 years of age. This range of ages indicated different levels of experiences and conceptualizations of cultural affiliation. When compared to their younger cohorts, individuals over 50 years old, likely identified more closely and more strongly to their culture of origin as they approached the life stage of becoming an "elder." This supposition followed the ideas from Jensen, Arnett, and McKenzie (2011), in which younger individuals' cultural identity was shown to be more plastic than older adults. The elder stage of life in American Indian culture carries the responsibility of cultural knowledge and in teaching the cultural practices and language to others. Elders are highly respected in Native communities, as they are the teachers of the cultural practices,

language, and beliefs of the tribe. Johnny Arlee (1998), a Bitterroot Salish cultural leader, quoted a Salish Elder in his book discussing Salish traditions: “Everything we do, we try to get the kids to learn” (p.73).

Another problem of the N.A.A.S. with this sample was the difficulty of establishing “true” Native identifications, resulting from transforming quantitative data into qualitative data. Despite the face value of the measure, it seemed to elicit confusion when attempting to decipher what the data implied. There was inherent difficulty in determining any classification of acculturation with this instrument, especially when the measure omitted the classification of marginal from the fourfold theory. It was also difficult to determine bicultural individuals. The difficulty with identifying a bicultural individual was due to the procedure of adding the scores of the participant and dividing the sum of the scores by the 21 items of the N.A.A.S. Garrett and Pichette (2000) determined that an average score of three would have classified an individual as bicultural. However, this parsimonious estimation was difficult to ascertain, as the scorer was left to determine whether to round the average score up, or down to the next whole number. This process lost information pertaining to the individual’s cultural identification. For example, if an average score was 2.6 to 3.4, the score rounded to three. This score led the researcher to believe that the individual was bicultural. However, both scores represent different types of cultural affiliations. A score of 2.6 represents an individual who maintains more of a traditional identification, in that their attitudes, beliefs, and practices lean more toward their culture of origin. Comparatively, someone who scores a 3.4 represents an individual who affiliates more with the majority culture. However, this type of individual also adheres to beliefs, attitudes, and practices

from their culture of origin. While the N.A.A.S. performs well, and most likely, overestimating in identifying individuals who represented the extreme ends of cultural identifications (i.e., < 1, traditional; > 3, acculturated) profound difficulties occur when attempting to categorize scores that fall between classifications (1 = highly traditional; 2 = traditional; 3 = bicultural; 4 = acculturated; 5 = highly acculturated). The N.A.A.S. does not include a scoring option for a marginalized individual. Given the definition of marginalization in the fourfold theory, it is likely to assume that an individual would need to score a zero to obtain this classification. Achieving such a score seems impossible since there is not a choice for an affiliation to neither the culture of origin nor the majority culture. Therefore, the ability of the N.A.A.S. to distinguish Native American cultural identification with this sample of American Indian undergraduate and graduate students is questionable.

The finding that the N.A.A.S. did not indicate a trend of fit to the data from this pilot sample resembled findings by Losada, Knight, Marquez-Gonzales, Montorio, Etxeberria, and Peñacoba (2008), in which they utilized factor analysis of the familism scale (FS) by Sabogal, Marin, Otero-Sabogal, Marin, and Perez-Stable (1987) with a sample of 135 Spanish caregivers of dementia patients. They found that the original model did not fit the data from their sample, due to poor item loadings into the five factors in the instrument. They were interested to determine whether the lack of item loadings was related to lack of cultural validity in the instrument. They found that the instrument fit the data from their sample after pruning items that did not obtain high loading values. They supposed the instrument fit better because items with low, or no

cultural validity were excluded, increasing the construct and cultural validity of the measure.

While this analysis did not prune specific items from the N.A.A.S., it did prune the attitude factor from the instrument. The attitude factor did not load any items with this sample. Perhaps the items that originally loaded into the attitudes factors were not culturally relevant for the American Indian tribes in this region, as the participants were university students from Tribes in the Northwestern and Midwestern United States. The N.A.A.S. was developed with American Indian high school students from tribes from the Eastern United States. Perhaps the make-up of the panel of experts (Eastern Tribal Elders and Indian Health Service Directors) that were utilized in the development of the N.A.A.S., possessed different attitudes when compared to this sample of Northern Plains and western Tribal systems. Additionally, perhaps the factor of Native American attitudes did not load any items, as the items were not culturally valid, overall. While American Indian people do possess particular attitudes about self, Tribe, and the environment it is likely the items included in this measure did not encapsulate the attitudes of this region. For instance, item 17, "Do you…?" (read a tribal Language) and item 18, "Do you…?" (write a tribal language language) may not have been relevant, as most Tribal languages were not taught by reading or writing. Instead, most Tribal languages were learned by hearing and associating the word to a real-world example, and repeating the word in the correct context(s). Many American Indian languages were not written until approximately the late 1800's or early 1900's. Because this sample consisted of American Indian university students, it was likely that the participants wrote English more proficiently than their Tribal language (if their Tribal language possesses a

written component). For example, when examining the responses to specific items in the N.A.A.S., it was found that 65% of all of the participants endorsed speaking "mostly English, some Tribal language and 41% endorsed speaking "English only." Additionally, 55% of the participants endorsed understanding "mostly English, some Tribal language" and 44% endorsed understanding "English only." Eleven percent (11%) of the participants specified that they think in "English and Tribal language equally;" 23% thought in "mostly English;" and 66% had thoughts in "English only." When examining ability to read language, 14% endorsed the ability to read both "English and Tribal language equally, 30% signified reading "mostly English," and 56% of the participants endorsed an ability to read "English only." Therefore, utilizing future factor analyses and pruning items with low communalities, low content validity, and low cultural validity might assist the model to fit the data in future studies.

Despite attaining a sample size that some researchers believe stabilize the statistics ($N = 100$), it was of value to utilize less conventional indices to infer a trend of fit of the S.A.F.E. with this sample of American Indian undergraduate and graduate students. Therefore, the concept of overdetermination was utilized in the analysis of the S.A.F.E. The S.A.F.E. possessed a *p:r* ratio of 24 items and six factors, or 24:6. This ratio produced a quotient of four items per factor. According to the guidelines set by MacCallum et al. (1999) and Comrey and Lee (1992), the S.A.F.E. did not achieve overdetermination. Despite the S.A.F.E. not attaining overdetermination of factors, it appeared to show a trend of fit to the data from this sample when the $\chi^2/df$ quotient of 1.19 was examined.

The S.A.F.E. performed well with this sample despite the measure having been developed for use with first or second generation Hispanic immigrants, who may have possessed difficulty speaking or understanding English. For example, items 13 and 22 posed questions pertaining to stress associated with understanding or speaking English (i.e., item 13, "People thought I was unsociable when in fact, I had trouble talking in English" and item 22, "I had trouble understanding others when they spoke"). This sample was comprised of American Indian undergraduate and graduate students born in the United States, who spoke and understood English proficiently, attended and graduated from an American university system. This researcher examined responses to specific items in the S.A.F.E. and found that 65% of the participants endorsed speaking "mostly English, some Tribal language and 41% endorsed speaking "English only." Additionally, 55% of the participants endorsed understanding "mostly English, some Tribal language" and 44% endorsed understanding "English only." Eleven percent of the participants specified that they think in "English and Tribal language equally," 23% thought in "mostly English," and 66% had thoughts in "English only." When examining the participants' abilities to read language, 14% endorsed the ability to read both "English and Tribal language equally, 30% signified reading "mostly English," and 56% endorsed an ability to read "English only." In terms of items on the S.A.F.E. which pertained to the ability to speak English (item 13, "People thought I was unsociable when in fact, I had trouble talking in English") 86% of the participants responded "not applicable." In terms of understanding language (item 22, "I had trouble understanding others when they spoke,") 72% of the participants responded "not applicable." Therefore, it is highly unlikely that a large number of participants in this study experienced difficulty reading,

understanding, or speaking English. These items did not appear to possess much relevance for this sample.

Curiously, this analysis produced two additional factors for the S.A.F.E. However, the sixth factor contained only one weakly loaded item: item 7, "It bothered me to think that so many people used drugs" (.27). This item originally loaded into the environmental stressors factor in the analysis from Mena et al. (1987). Perhaps this item would load into the fourth factor once again with a different American Indian sample of greater size.

Mena et al. (1987) proposed that three items loaded into the familial factor: item 3, "It bothered me that family members I was close to did not understand my different values;" item 4, "Close family members and I had conflicting expectations about my future;" and item 6, "My family did not want me to move away but I wanted to." While family was mentioned in the items, it appeared that the items also included the social network, not predominantly their families. This might have led to the above items loading into the Social Stressors factor, rather than what Mena et al. (1987) proposed in their analysis.

Despite a great variability in age (range 18 – 61 years) of this sample, the S.A.F.E. performed well. Thirty-nine participants were over the age of 30, which is somewhat older than would be expected for a university sample, but often expected for American Indian students. Thirty-nine participants were over the age of 30 and nine of these participants were over the age of 45. These nine participants have likely seen and experienced more overt racial and ethnic turmoil in their lifetimes when compared to

their younger cohort. These experiences likely elicited more stress upon the older students, eliciting higher scores on the S.A.F.E.

Also, 10 of the 24 items of the S.A.F.E. possessed high (.6 - .9) communalities, which were related to lower sampling error and inferred a better fit of the measure to the data obtained from the sample. Less than half of the items achieved high communalities (10 items attained communalities higher than .70). The S.A.F.E. obtained a $\chi^2$/df ratio of 1.32, a ratio proposed by Hatcher (1994) to be a better measure of fit than chi-square, which inferred the S.A.F.E. showed a trend of fit with the data. The S.A.F.E. appeared to possess more variability between the communalities of the items (.29 to .73) when compared to the communalities of the N.A.A.S.

Lastly, a significant, negative correlation was found between the individually summed scores of the N.A.A.S. and the S.A.F.E., which infers that individuals, who scored lower on the N.A.A.S., achieved higher scores of acculturative stress on the S.A.F.E. scale. This assumption refuted the findings from Rodriguez and colleagues (2000). They discovered that assimilated Hispanic students reported higher levels of acculturative stress as a function of lacking the understanding of customs and their native language (p. 1546). In this study, American Indian/Alaska Native students who scored lower on the N.A.A.S. (low acculturation), reported higher levels of acculturative stress on the S.A.F.E. scale. The findings of this analysis corresponded with a study conducted by Romero and Roberts (2003), where they found that U.S. born, Mexican-American adolescents "reported more stress because of the need to speak better Spanish and because they felt as though they could not be like American kids" (p. 179). Hence, the adolescents in their study expressed higher experiences of acculturative stress when they

affiliated with their culture of origin; specifically in speaking their Native language. Whereas, an individual who is more acculturated may possess minimal or no conflict about his/her decision of cultural affiliation and report less acculturative stress.

In this study, a negative correlation was found between low acculturation and highly perceived cultural stress. The present data partly reflected findings from previous research that acculturation level correlated with reported acculturative stress. It did not reinforce findings that low acculturated individuals reported less acculturative stress (Dona & Berry, 1994; LaFromboise, Coleman, & Gerton, 1993). It was difficult to determine whether bicultural individuals scored differently from their acculturated counterparts. The difficulty began with the problem categorizing the data from this pilot sample ($N$ = 100). Not having the ability to establish acculturation affinity accurately could have caused the reviewer to miss information concerning traditional, bicultural, and acculturated individuals. The N.A.A.S. also did not provide a procedure for identifying a marginalized individual, as Garrett and Pichette (2000) did not include a "neither culture" option in the instrument.

Additionally, research on culture identification has shown that higher adherence to the culture of origin was a protective factor against psychopathology, namely depression (Rieckman, Wadsworth, & Deyhle, 2004). Specific psychopathologies were not studied with this sample. However, identifying protective factors with AI/AN college students, in relation to their levels of acculturation, could be a future direction for study. Rousey and Longie (2001) found that American Indian students who had begun their college education in a Tribal college experienced less acculturation and educational stress, and possessed a negative relationship with attrition rates.

The finding of a significant, negative correlation between low acculturation scores from the N.A.A.S. and perceived acculturation stress from the S.A.F.E. *partially* reflected previous findings (Dona & Berry, 1994; LaFromboise, Coleman, & Gerton, 1993; and Williams & Berry, 1991). These findings disputed the existing research (Krishnan & Berry, 1992) that bicultural individuals tended to report less acculturative stress than students who identified as either traditional or as acculturated. Dona and Berry (1994); LaFromboise, et al, (1993); and Williams and Berry (1991) all found that bicultural individuals reported less acculturative stress than their counterparts. If this were true, this analysis would not have shown a significant, negative correlation between acculturation scores from the N.A.A.S. and acculturation stress scores from the S.A.F.E. Instead, one would have expected to see a curvilinear relationship, in which the relationship would resemble a "V." Such a line would have indicated that bicultural individuals experience less acculturative stress, while more traditional and more acculturated individuals experienced higher acculturative stress, respectfully.

Alternatively, Krishnan & Berry (1992) proposed that bicultural individuals reported more acculturative stress than their traditional or acculturated cohorts. Again, these findings partially reflect previous findings in that less acculturated (or, traditional, bicultural) individuals reported more acculturative stress than highly acculturated individuals. It was difficult to determine whether a difference was present in the unidimensional categories of acculturation (i.e., traditional, bicultural, and acculturated) because of the difficulty in the ability of the N.A.A.S. in delineating acculturation status effectively. An even larger sample N = >300) than the sample obtained in this study, might assist to parse out these differences in future studies.

**Limitations**

There were many limitations inherent in this study. One of the most important limitations was this psychometric evaluation cannot be generalized as representative for *all* American Indians, as a convenience sample was used. It is difficult to generalize any findings with American Indian samples due to the heterogeneity of cultural beliefs and practices between American Indian Tribes and Alaska Native Villages. While general concepts are similar between tribes (creation stories, connections with nature, oral languages, songs, ceremonies, etc.), there are inherent differences how and when various tribes conduct their traditions. For example, tribes have different spiritual times of the year. The Interior Salish's main spiritual ceremonies are held in the winter months and incorporate specific dancing ceremonies, as well as ceremonial songs (Arlee, 1998) as compared to other Northern Plains tribes. Many tribes conduct their ceremonies, such as the Sun Dance, in the summer (Yellowtail, 2007). Likewise, different tribal systems may react and respond to stressors differently from one another. It is also possible that the reactions and responses to acculturative stress are different intra-tribally, meaning that family systems within the same tribal group might display variant response styles to similar stressors. Various factors are likely involved in the variability of responses to stressors within the tribe. Different family systems from the same tribe likely have alternate perspectives, perceptions, experiences, collective personalities, and coping strategies to stressors in their environments. Therefore, it might prove helpful to conduct psychometric evaluations of the N.A.A.S. and the S.A.F.E. Acculturation Stress Scale with and within various Tribes / Villages to ascertain the validity and reliability of these measures between and within these systems.

Another important limitation was the controversy imbedded in the fourfold acculturation theory proposed by Berry (1980). Rudmin (2003) provided many arguments to consider when examining acculturation. In particular, he described 16 possibilities for *independent* levels of acculturation utilizing Boolean logic, which identified two cultures, two attitudes, two identities, and two languages (pg. 25). The evidence that Rudmin (2003) provided concerning the errors of the fourfold theory, lends question to *any* acculturation measure based upon the fourfold theory. He inferred that the fourfold theory was too short-sided in the view of culture. He suggested that the fourfold theory erroneously presumed that there are only two cultures interacting within an individual at any time and that the two cultures have nothing in common with one another. He also noted that the fourfold theory only accounted for "conjunction by union but not conjunction by intersection" (p. 25). His statement implied that the fourfold theory only identified how the individual identified in either the majority or minority cultures and did not take into consideration the identification that intersects both cultures (varying dimensions of biculturalism). Rudmin and Ahmadzadeh (2001) also identified similar arguments pertaining to the absence of content and construct validity of the fourfold theory of acculturation. They described the shortcomings of the fourfold model when compared to the Heiderian model, which identified 64 possible acculturation scenarios (eight likely attitudes and eight likely formations of culture). When the fourfold model is compared to the Boolean and Heiderian paradigms, it appears that the fourfold model omits valuable information. Therefore, how likely is it that any tool based upon the fourfold theory possessed construct or cultural validity when the theory has missed so much information?

An additional limitation inherent in this study was the N.A.A.S. required the researcher to interpret quantitative data into qualitative information. Despite the perceived value of the measure, it seemed to elicit confusion when interpreting what the quantitative data implies. There was difficulty in determining the point in which the researcher could definitively categorize individual results from the N.A.A.S. as "bicultural." This was due to the procedure of summing the scores and dividing the sum by the total number of items in the measure. The authors of the N.A.A.S. determined that a score of three (3) would classify an individual as "bicultural." However, this parsimonious estimation was difficult to ascertain, as there were no implicit guidelines for rounding data up or down to the nearest whole number for categorization of acculturative status. The N.A.A.S. also did not provide a way of classifying a marginal individual. According to fourfold theory definition, a marginalized individual rejects both their culture of origin and the majority culture. Therefore, a choice of "neither Native nor English" might prove helpful. The entire Likert structure of the N.A.A.S. would need reconfiguration, as the "neither" choice would likely score as zero. The likelihood of a participant scoring zero on the entire instrument would probably be low, as the questions pertaining to language would require an answer of "English" or "Native," resulting in at least a score of x? Answering either choice would produce a score on the instrument and thereby prove it difficult to distinguish marginalization. The aforementioned limitations question the utility of the N.A.A.S. and its ability to measure acculturation with an American Indian sample. The authors developed the N.A.A.S. to assist clinicians in determining the acculturation status of American Indians enabling them to then provide more culturally-appropriate treatment plans as proposed by

researchers concerning enculturation, where the individual gravitates toward the customs of their culture of origin (Winterowd, Montgomery, Stublingbear, Harless, & Hicks, 2008). However, does this instrument outperform a clinical intake interview conducted by the professional clinician? Given the proposed acculturation classifications omitted by the fourfold theory (12 classifications), the N.A.A.S. does not give the clinician the information for which they were searching.

Another limitation was the size of this sample. While 100 American Indian undergraduate and graduate students participated in this study, the data derived from this study should be considered pilot data. In concordance with guidelines for sample size in factor analysis (Comrey & Lee, 1992; Guilford, 1954), a more suitable sample size would be 300-500 participants in order to parse out item and factor loadings of these two measures. While this study elicited trends of factor loadings and the instruments fit with the sample, it could not provide the information necessary to infer the inherent factors or fit of the instruments. A larger sample could lend or revoke support about the factor structure (from exploratory factor analysis) and fit (from a confirmatory factor analysis) of the N.A.A.S. and S.A.F.E.

**Future Directions**

There are numerous directions for future research with this study. Potentially the most important, is psychometrically evaluate the N.A.A.S. and S.A.F.E. Acculturation Stress Scale for implementation with a more representative American Indian sample. This study only measured these instruments with a convenient, pilot sample of AI/AN university students. The results of this analysis *should not* be taken as a gross generalization about the overall AI/AN population. The measures should be evaluated for

use with each tribal system in the United States and Canada to discover or determine regional and tribal differences. It is important to realize that the evaluations with individual tribal systems will only produce "Tribal-specific generalizability," or at best, regional information for the measures. It would not provide a global generalizability that scientific research prefers. Nonetheless, the information generated from these types of studies is welcomed, considering the minute amount of studies with American Indians communities available. It might prove beneficial to implement exploratory factor analysis of these two instruments with a larger sample of American Indians ($N$ = >300) and run confirmatory factor analysis with the two instruments regionally, to determine the fit of the instruments with the larger sample. This could provide information associated with the future direction discussed concerning regional and Tribal differences in the results of both instruments.

Another direction is to measure the validity and reliability of the N.A.A.S. with a more representative sample of American Indians, based upon 2010 census data. This effort could provide insight into the method of Garrett and Pichette gaining expert panel opinions to determine the validity of their instrument. The accurate collection and depiction of various demographic data would offer a more indicative depiction of the AI/AN population in the states, regions, and country as a whole. Using a more representative sample (age, gender, acculturation status) of American Indian participants could produce different results for the N.A.A.S. A possible confound to the information received from measuring the instrument with this sample given that this sample was a convenience sample from a state university and not from an American Indian reservation. Theoretically, American Indian individuals who attend a state college or university

immediately after post-secondary education possess a sufficient amount of comfort with Western society. These individuals likely identify as more bicultural or acculturated, making them less likely to experience high levels of acculturative stress. Possessing this comfort with the Western societal practices and expectations, might also make these individuals less likely to alter their educational endeavor. Alternatively, individuals who choose to attend Tribal colleges may not possess the same comfort level with a disparate culture as the aforementioned bicultural and acculturated cohort. Lacking a large number of "more traditional" American Indian students in this sample, could have affected the results of this study with the N.A.A.S.

While somewhat related to the previous direction of study, another possible topic for research could involve examining the similarities and differences in both acculturation and perceived acculturation stress between American Indian college students who first attend a Tribal college versus American Indian students who only attend a State college/university. Rousey and Longie (2001) found that American Indian students who had begun their college education in a Tribal college had lower academic attrition rates than American Indian students who solely attended a non-Native college/university.

It might also be of merit to examine possible gender, age, and year in school differences, as well as strength and direction of correlation with the N.A.A.S. and S.A.F.E. It would be of interest to determine whether studies with similar samples would produce information corroborating findings by Jensen, Arnett, and McKenzie (2011). They suggested a negative correlation between age and cultural identification. They found that with older individuals tended to identify with their culture of origin.

The N.A.A.S. did not provide a way of distinguishing the marginalized acculturation category. Therefore, a future direction would be to include a choice of "neither Native nor English" in the items of the N.A.A.S. This choice would likely need to be coded zero and could provide supportive or non-supportive information concerning the validity, reliability, and utility of the N.A.A.S. and the fourfold theory of acculturation.

An additional direction might be to utilize other statistical software packages, such as LISREL or AMOS to conduct a factor analysis with this sample. Utilizing the AMOS software package to conduct a factor analysis with this data could elucidate details not provided by SPSS. The missing details could provide a more accurate interpretation of the observed data and error approximation for this sample. The GFI is considered to be a robust measure of fit, as it is not affected as profoundly as other indices by sample size; in this case a sample size at or less than one hundred ($n$ = 100). While the $\chi^2$, $\chi^2$/df, overdetermination, and item communalities provided some information concerning fit of the N.A.A.S. and S.A.F.E., it seems other fit indices provide more information concerning error measurement. For example, Marsh, Balla, and McDonald (1988), determined that the GFI is relatively immune to the effects of sample size. The GFI is an index more commonly computed utilizing AMOS or LISREL. For instance, AMOS produced a goodness-of-fit index (GFI), in which a value of .90 was acceptable (Kelloway, 1998, as cited by Gutierrez, Franco, Powell, Peterson, & Reid, 2009). AMOS also produced the Root Mean Square of Error Approximation (RMSEA). Brown and Cudek (1992) proposed guidelines that established the fit of the model to the observed data utilizing RMSEA: < .05 was considered good fit; .05 to .08

was considered acceptable fit; .08 to .10 was considered marginal; and anything greater than .10 was a poor fit. Having these indices available in SPSS would have greatly enhanced the researcher's ability in determining the goodness-of-fit between the model and the observed data. Instead, utilizing the AMOS software package to conduct a factor analysis with this data could parse out details not provided by SPSS.

Given the controversy with the fourfold theory of acculturation, a future study could examine Heider's paradigm of acculturation, as described by Rudmin and Ahmadzadeh (2001), in which the Heiderian model examined the perceptual-cognitive aspects for understanding the social-relational formations between the attitudes of the individual, how they related to their culture of origin, and how they related to other cultures. This model also incorporated the attitude of the individual's culture of origin toward other cultural communities. There were eight possible attitude situations (individual liking/disliking culture of origin, liking/disliking other culture, culture of origin liking/disliking other culture, and other culture liking/disliking individual's culture of origin). There were also eight formation situations (factual and public perceptions of unit formation which are based upon geographic location or cultural similarities), for 64 possible acculturation situations. In theory, this model appears to possess the potential for both cultural and construct validity, as the paradigm of acculturation appeared more measureable than the fourfold theory of acculturation.

Lastly, despite the factor structure obtained and promising performance of the S.A.F.E. with this sample, changing the procedure of coding the "not applicable" response on the S.A.F.E. might produce different results. Mena et al. (1987) instructed users to code the "not applicable" response as a zero when coding for analysis. However,

if the researcher did not code a number for “not applicable” responses, the analysis might elicit different factor loadings that would approximate the loadings found by Mena et al. (1987).

## References


Arlee, J. (1998). *Over a century of moving to the drum: Salish Indian celebrations on the Flathead Indian Reservation.* R. Bigart, (Ed.). Pablo, MT: Salish Kootenai College Press.

Arrindell, W. A., & Van der. Ende, J. (1985). An empirical test of the utility of the observations-to-variables ratio in factor and components analysis. *Applied Psychological Measurement,* 9(2), 165-178. doi: 10.1177/014662168500900205

Atkinson, D. R., Lowe, S., & Matthews, L. (1995). Asian-American acculturation, gender, and willingness to seek counseling. *Journal of Multicultural Counseling and Development, 23*(3), 130-138. doi: 10.1002/j.2161-1912.1995.tb00268.x

Beiser, M. N., & Hou, F. (2006). Ethnic identity, resettlement stress and depressive affect among Southeast Asian refugees in Canada. *Social Sciences and Medicine*, *63*(1), 137-150.

Berry, J. W. (1980). Acculturation as varieties of adaptation. In A. Padilla (Ed.), *Acculturation: Theory, models and findings* (pp. 9–25). Boulder: Westview.

Berry, J. W. (1989). Imposed etics-emics-derived etics: The operationalization of a compelling idea. *International Journal of Psychology, 24,* 721-735.

Berry, J. W. (1999). Emics and etics: A symbolic conception. *Culture and Psychology, 5*(2), 165-171.

Berry, J. W. (2009). A critique of critical acculturation. *International Journal of Intercultural Relations, 33,* 361-371.

Berry, J. W., & Kim, U. (1988). Acculturation and mental health. In P. Dasen, J.W. Berry, & N. Sartorius (Eds.), *Health and cross-cultural psychology: Towards application*. Newbury Park: Sage.

Berry, J. W., Kim, U., Power, S., Young, M. (1989). Acculturation attitudes in plural societies. *Applied Psychology: An International Review*, *38*(2), 185-206.

Blume, A. W., Resor, M. R., Villanueva, M. R., & Braddy, L. D. (2009). Alcohol use and comorbid anxiety, traumatic stress, and hopelessness among Hispanics. *Addictive Behaviors, 34*(9), 709-713.

Bohrnstedt, G. W. (1969). A quick method for determining the reliability and validity of multiple-item scales. *American Sociological Review, 34*(4), 542-548.

Brown, G. T., & Gaboury, I. (2006). The measurement properties and factor structure of the test of visual-perceptual skills-revised: Implications for occupational therapy assessment and practice. *The American Journal of Occupational Therapy, 60*(2), 182-193.

Brown, M. W., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological Methods and Research, 21*, 230–258.

Caetano, R., Ramisetty-Mikler, S., Caetano-Vaeth, P. A., & Harris, T. R. (2007). Acculturation stress, drinking, and intimate partner violence among Hispanic couples in the U.S. *Journal of Interpersonal Violence*, *22*(11), 1431–1447.

Carmines, E. G., & Zeller, R. A. (1976). Reliability and validity assessment. Sage University Paper Series on Quantitative Applications in the Social Sciences, Series No. 07-004. Newbury Park, CA: Sage.

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research, 1,* 245-276.

Cattell, R. B., & Jaspers, J. (1967). A general plasmode (No. 30-10-5-2) for factor analytic exercises and research. *Multivariate Behavioral Research Monographs*, No. 67-3.

Cattell, R. B., & Vogelmann, S. (1977). A comprehensive trial of the scree and KG criteria for determining the number of factors. *Multivariate Behavioral Research, 12*, 289-325.

Chen, I. G., Roberts, R. E., & Aday, L. A. (1998). Ethnicity and adolescent depression: the case of Chinese Americans. *Journal of Nervous Mental Disorders, 186*(10), 623-630.

Choney, S. K., Berryhill-Paapke, E., & Robbins, R. R. (1995). The acculturation of American Indians: Developing frameworks for research and practice. In J. G. Ponterotto, J. M. Casas, et al. (Eds.). *Handbook of multicultural counseling* (pp.73-92). Thousand Oaks, CA: Sage Publications, Inc.

Comrey, A. L., & Lee, H. B. (1992). A first course in factor analysis. Hillsdale, NJ: Erlbraum.

Constantine, M. G., Okazaki, S., & Utsey, S. O. (2004). Self-concealment, social self-efficacy, acculturative stress, and depression in African, Asian, and Latin American international college students. *American Journal of Orthopsychiatry*, *74*(3), 230-241.

Conway, K. P., Swendsen, J. D., Dierker, L., Canino, G., & Merikangas, K. R. (2007). Psychiatric comorbidity and acculturation stress among Puerto Rican substance abusers. *American Journal of Preventative Medicine*, 32(6), S219 – S225.

Costello, A. B., & Osborne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research & Evaluation*, 10(7). Available online: http://pareonline.net/getvn.asp?v=10&n=7

Cronbach, L. J. (2004). My current thoughts on coefficient alpha and successor procedures. *Educational and Psychological Measurement*, 64(3), 391-418.

Cronbach, L. J. (1988). Internal consistency of tests: Analysis old and new. *Psychometrika*, 53(1), 63-70.

Cronbach, L. J. (1971). Validity. In: R. L. Thorndike (ed.), *Educational Measurement*, 2nd ed. Washington, DC: American Council on Education, pp. 443-597.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16, 297-334.

Cronbach, L. J., & Azuma, H. (1962). Internal consistency reliability formulas applied to randomly sampled single-factor tests: An empirical comparison. *Educational and Psychological Measurement*, 22(4), 645-665.

Cronbach, L. J., & Gleser, G. C. (1959). Interpretation of reliability and validity coefficients. *Journal of Educational Psychology*, 50(5), 230-237.

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin*, 52(4), 281-302.

Cuellar, I., Harris, L. C., & Jasso, R. (1980). An acculturation scale for Mexican American normal and clinical populations. *Journal of Behavioral Sciences, 2*(3), 199-217.

Daniel, M., O'Dea, K., Rowley, K. G., McDermott, R., & Kelly, S. (1999). Glycated hemoglobin as an indicator of social environmental stress among Indigenous versus Westernized populations. *Preventative Medicine*, *29*(5), 405-413.

Deyo, R. A., & Diehl, A. K. (1983). Measuring physical and psychosocial function in patients with low-back pain. *Spine, 8*(6), 635-642.

Dona, G., & Berry, J. W. (1994). Acculturation attitudes and acculturative stress of Central American Refugees. *International Journal of Psychology*, *29*(1), 57-70.

Duan, C., & Vu, P. (2000). Acculturation of Vietnamese students living in or away from Vietnamese communities. *Journal of Multicultural Counseling and Development, 28*(4), 225-242.

Duarte, C. S., Bird, H. R., Shrout, P. E., Wu, P., Lewis-Fernandez, R., Shen, S., & Canino, G. (2008). Culture and psychiatric symptoms in Puerto Rican children: longitudinal results from one ethnic group in two contexts. *Journal of Child Psychology and Psychiatry*, *49*(5), 563-572.

Ebel, R. L. (1961). Must all tests be valid? *American Psychologist, 16*(10), 640-647. doi: 10.1037/h0045478

Fabringar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, *4*(3), 272-299.

Finley, V. S. (1999). A preliminary study in the development of an acculturation scale for use with Native Americans. (Doctoral dissertation, University of Georgia, 1999). *ProQuest Dissertations and Theses. 525*(77), pg. 120. (UMI No. 9929023).

Fuertes, J. N., & Westbrook, F. D. (1996). Using the social, attitudinal, familial, and environmental (S.A.F.E.) acculturation stress scale to assess the adjustment needs of Hispanic college students. *Measurement and Evaluation in Counseling and Development, 29*, 67-76.

Garrett, M. T. (1996). "Two People": An American Indian narrative of bicultural identity. Journal of American Indian Education, 36, 1-21.

Garrett, M. T. & Pichette, E. F. (2000). Red as an apple: Native American acculturation and counseling with or without reservation. *Journal of Counseling and Development*, 78(1), 3-13.

Glass, M. H. (1996). Acculturation, personality, and Alaska Natives. (Doctoral dissertation, University of Wyoming, 1996). *Dissertation Abstracts International: Section B: The Sciences & Engineering*, 57(1-B), 0762.

Guilford, J. P. (1954). The validity of an "indecision" score for prediction of proficiency of foremen. *Journal of Applied Psychology*, 38(4), 224-226. doi: 10.1037/h0062442

Gorsuch, R.L. (1997). Exploratory factor analysis: Its role in item analysis. *Joumal of Personality Assessment, 68,* 532-560.

Gorsuch, R. L. (1983). *Factor Analysis* (2nd Ed.). Hillsdale, NJ: Erlbaum.

Gutierrez, M. A., Franco, L. M., Powell, K. G., Peterson, N. A., & Reid, R. J. (2009). Psychometric properties of the acculturation rating scale for Mexican Americans II: Exploring dimensions of marginality among a diverse Latino population. *Hispanic Journal of Behavioral Sciences*, *31*(3), 340-356.

Hatcher, L. (1994). A step-by-step approach to using the SAS system for factor analysis and structural equation modeling. Cary, NC: SAS Institute.

Haynes, S. N., Richard, D. C. S., & Kubany, E. S. (1995). Content validity in psychological assessment: A functional approach to concepts and methods. *Psychological Assessment*, 7(3), 238-247.

Hennessy, C. H., & John, R. (1995). The interpretation of burden among Pueblo Indian caregivers. *Journal of Aging Studies*, 9(3), 215-229.

Horn, J .L. (1965). A rationale and technique for estimating the number of factors in factor analysis. *Psychometrika*, 30, 179-185.

Indian Health Service. (February 2001). *Heritage & Health. Mental Health*. Retrieved April 7, 2003, from http://info.ihs.gov

Jensen, L. A., Arnett, J. J., & McKenzie, J. (2011). Globalization and cultural identity developments in adolescence and emerging adulthood. In Schwartz, S. J., Luyckx, K., & Vignoles, V. L. (Eds.), Handbook of Identity Theory and Research (pp. 285-301). New York, NY: Springer Publishing Company.

Kaiser, H. F. (1970). A second generation Little-Jiffy. *Psychometrika*, 35, 401-415.

Kelley, T. L. (1921). The reliability of test scores. *Journal of Educational Research, 3*, 370-379.

Kim, B. S. K., & Omizo, M. M. (2006). Behavioral acculturation and enculturation and psychological functioning among asian american college students. *Cultural Diversity and Ethnic Minority Psychology, 12*(2), 245-258. doi: 10.1037/1099-9809.12.2.245

Kim, E. J., O'Neil, J. M., & Owen, S. V. (1996). Asian-American men's acculturation and gender-role conflict. *Psychological Reports*, 79, 95-104.

Kline, P. (1993). *The handbook of psychological testing (2nd ed.)*. Florence, KY, US: Taylor & Frances/Routledge, Florence, KY. Retrieved from http://search.proquest.com/docview/619521725?accountid=14593

Kline, P. (1998). *The new psychometrics: Science, psychology and measurement*. Florence, KY, US: Taylor & Frances/Routledge, Florence, KY. Retrieved from http://search.proquest.com/docview/619405988?accountid=14593

Knafl, K., Deatrick, J., Gallo, A., Holcombe, G., Bakitas, M., Dixon, J., & Grey, M. (2007). The analysis and interpretation of cognitive interviews for instrument development. *Research in Nursing & Health*, *30*, 224-234.

Krishnan, A., & Berry, J. W. (1992). Acculturative stress and acculturation attitudes among Indian immigrants to the United States. *Psychology and Developing Societies, 4*(2), 187-212.

Kuder, G. F., & Richardson, M. W. (1937). The theory of the estimation of test reliability. *Psychometrika, 2*, 151-160. doi: 10.1007/BF02288391

LaFromboise, T. D., Coleman, H. L. K., & Gerton, J. (1993). Psychological impact of biculturalism: Evidence and Theory. *Psychological Bulletin*, *114*(3), 395-412.

LaFromboise, T. D., Trimble, J. E., & Mohatt, G. V. (1990). Counseling intervention and American Indian tradition: An integrative approach. *The Counseling Psychologist*, *18*(4), 628-654.

LaFromboise, T. D., & Bigfoot, D. S. (1988). Cultural and cognitive considerations in the prevention of American Indian adolescent suicide. *Journal of Adolescence*, *11*, 139-153.

Little Soldier, L. (1985). To soar with eagles: Enculturation and acculturation of Indian children. *Childhood Education*, *61*(3), 185-191.

Lord, F. M. (1955). Sampling fluctuations resulting from the sampling of test items. *Psychometrika, 20,* 1-22. doi: 10.1007/BF02288956

Losada, A., Knight, B. G., Marquez-Gonzalez, M., Montorio, I., Etxeberria, I., & Peñacoba, C. (2008). Confirmatory factor analysis of the familism scale in a sample of dementia caregivers. *Aging & Mental Health*, 12(4), 504-508.

Marsh, H. W., Balla, J. R., & McDonald, R. P. (1988). Goodness-of-fit indexes in confirmatory factor analysis: The effect of sample size. *Psychological Bulletin*, *103*(3), 391-410.

McQueen, A., Getz, J. G., & Bray, J. H. (2003). Acculturation, substance use, and deviant behavior: Examining separation and family conflict as mediators. *Child Development*, 74(6), 1737-1750.

McLeod, S. A. (2007). Simply Psychology; Psychology Research Methods. Retrieved from http://www.simplypsychology.org/research-methods.html

Mena, F. J., Padilla, A. M., & Maldonado, M. (1987). Acculturative stress and specific coping strategies among immigrant and later generation college students. *Hispanic Journal of Behavioral Sciences*, *9*(2), 207- 225.

Mendoza, R. H. (1989). An empirical scale to measure type and degree of acculturation in Mexican-American adolescents and adults. *Journal of Cross-Cultural Psychology*, *20*(4), 372-385.

Miller, M. J. (2007). A bilinear multidimensional measurement model of Asian American acculturation and enculturation: Implications for counseling interventions. *Jounal of Counseling Psychology*, 54(2), 118-131.

Moran, J. R., Fleming, C. M., Somervell, P., & Manson, S. M. (1999). Measuring bicultural ethnic identity among American Indian adolescents: A factor analytic study. *Journal of Adolescent Research*, *14*(4), 405-426.

Nevo, B. (1985). Face validity revisited. *Journal of Educational Measurement, 22*(4), 287-293. doi: 10.1111/j.1745-3984.1985.tb01065.x

Newfields, T. (2002). Challenging the notion of face validity. *SHIKEN: The JALT Testing and Evaluation SIG Newsletter* 6(3): 19. Available: http://www.jalt.org/test/new 2.htm

Nguyen, N. A., & Williams, H. L. (1989). Transition from east to west: Vietnamese adolescents and their parents. *Journal of the American Academy of Child & Adolescent Psychiatry*, *28*(4), 505-515. doi: 10.1097/00004583-198907000-00007

Nunnally, J. C. (1978). *Psychometric Theory*. New York: McGraw-Hill Book Company.

Nwadiora, E., & McAdoo, H. (1996). Acculturative stress among Amer-Asian refugees: gender and racial differences. *Adolescence, 31*(122), 477-487.

Oetting, E. R,. & Beauvais, F. (1990). Orthogonal cultural identification theory: The cultural identification of minority adolescents. *The International Journal of the Addictions*, 25(5a-6a), 655-685.

Oetting, E. R., Swain, R. C., & Chiarella, M. C. (1998). Factor structure and invariance of the orthogonal cultural identification scale among American Indian and Mexican American youth. *Hispanic Journal of Behavioral Sciences*, *20*(131), 131-154. DOI: 10.1177/07399863980202001

Ogbu, J. U., & Simons, H. D. (1998). Voluntary and involuntary minorities: A cultural-ecological theory of school performance with some implications for education. *Anthropology & Education Quarterly*, *29*(2), 155-188. Retrieved July 19, 2004, from Wilson OmniFile Full Text database.

Ogunwole, S. U. (2002). The American Indian and Alaska Native Population: 2000. Census 2000 Brief.

Padilla, A. M. (1985). Acculturation and stress among immigrants and later generation individuals. *Spanish Speaking Mental Health Research Center Occasional Papers*, *20*, 41-60.

Padilla, A.M., Alvarez, M., & Lindholm, K. J. (1986). Acculturation and stress in immigrant students. *Hispanic Journal of Behavioral Sciences, 8*, 275-288.

Pawliuk, N., Grizenko, N., Chan-Yip, A., Gantous, P, Mathew, J., & Nguyen, D. (1996). Acculturation style and psychological functioning in children of immigrants. *American Journal of Orthopsychiatry*, *66*(1), 111-121.

Phinney, J. S., Ong, A., & Madden, T. (2000). Cultural values and intergenerational value discrepancies in immigrant and non-immigrant families. *Child Development, 71*(2), 528-539. doi: 10.1111/1467-8624.00162

Polit, D. F., Beck, C. T., & Owen, S. V. (2007). Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in Nursing & Health, 30,* 459-467.

Reed, R. J., Brown, T. L., Peterson, N. A., Snowden, L., & Hines, A. (2009). Testing the factor structure of a scale to assess African American acculturation: A confirmatory factor analysis. *Journal of Community Psychology, 37*(3), 293-304.

Rieckmann, T. R., Wadsworth, M. E., Deyhle, D. (2004). Cultural identity, explanatory style, and depression in Navajo adolescents. *Cultural Diversity, and Ethnic Minority Psychology, 10*(4), 365-382..

Roberts, D. M. (2000). Face validity: is there a place for this in measurement? *SHIKEN: The JALT Testing and Evaluation SIG Newsletter 4*(2): 5. Available: http://www.jalt.org/test/rob 1.htm.

Rodriguez, N., Myers, H. F., Morris, J. K., & Cardoza, D. (2000). Latino college student adjustment: Does an increased presence offset minority-status and acculturative stresses? *Journal of Applied Social Psychology, 30*(7), 1523-1550.

Rousey, A., & Longie, E. (2001). The tribal college as a family support system. *American Behavioral Scientist, 44*(9), 1492-1504.

Rudmin, F. W. (2003). Critical history of the acculturation psychology of assimilation, separation, integration, and marginalization. *Review of General Psychology, 7*(1), 3-37.

Rudmin, F. W., & Ahmadzadeh, V. (2001). Psychometric critique of acculturation psychology: The case of Iranian migrants in Norway. *Scandinavian Journal of Psychology, 42,* 41-56.

Rulon, P. J. (1939). A simplified procedure for determining the reliability of a test by split-halves. *Harvard Education Review,* 9, 99-103.

Sabogal, F., Marín, G., Otero-Sabogal, R., & Marín, B. V. (1987). Hispanic familism and acculturation: What changes and what doesn't? *Hispanic Journal of Behavioral Sciences, 9*(4), 397-412. doi: 10.1177/07399863870094003

Sartori, R. (2009). Face validity in personality tests: Psychometric instruments and projective techniques in comparison. *Quality & Quantity, 44*(4), 749-759.

Sartori, R., & Pasini, M. (2007). Quality and quantity in test validity: How can we be sure that psychological tests measure what they have to? *Quality & Quantity, 41,* 359-374.

Schwartz, S. J., Montgomery, M. J., & Briones, E. (2006). The role of identity in acculturation among Immigrant people: Theoretical propositions, empirical questions, and applied recommendations. *Human Development, 49*(1), 1-30. DOI: 10.1159/000090300

Smith, L. T. (1999). *Decolonizing methodologies: Research and Indigenous peoples.* London, UK.: Zed Books, Ltd.

Suinn, R. M., Rickard-Figueroa, K., Lew, S., & Vigil, P. (1987). The Suinn-Lew Asian self-identity acculturation scale: An initial report. *Educational & Psychological Measurement, 47*(2), 401-407.

Thompson, B. (2004). *Exploratory and confirmatory factor analysis: Understanding concepts and application.* Washington, DC: American Psychological Association.

Thurstone, L. L. (1947). *Multiple-factor analysis; a development and expansion of the vectors of mind*. Chicago, IL, US: University of Chicago Press, Chicago, IL. Retrieved from http://search.proquest.com/docview/615163350?accountid=14593

Trahan, M. (2007). *Distance from family, years of life on reservation/village, level of acculturation, gender, and acculturation stress of American Indian/Alaska Native students at The University of Montana* (Unpublished master's thesis). The University of Montana, Missoula, MT.

Trahan, M. B., & Swaney, G.I. (2004). *Reconceptualizing the Native American Acculturation Scale (N.A.A.S.)* (Unpublished work). The University of Montana, Missoula, MT.

Trochim, W. M. (2006). *External validity*. Retrieved from http://www.social research methods.net/kb/external.php

Wagner, T. (2002). *Making the grade: Reinventing America's schools*. New York, NY: Routledge Falmer.

United States Bureau of Indian Affairs. (2010). *Indian entities recognized and eligible to receive services from the United States Bureau of Indian Affairs* [Notice]. Retrieved from http://www.bia.gov/idc/groups/xraca/documents/text/idc011463.pdf

United States Census Bureau. (2011). *Overview of race and Hispanic origin: 2010* [Census Briefs]. Retrieved from http://www.census.gov/prod/cen2010/briefs/c2010br-02.pdf

Vogt, D. S., King, D. W., & King, L. A. (2004). Focus groups in psychological assessment: Enhancing content validity by consulting members of the target population. *Psychological Assessment*, *16*(3), 231-243.

von Hapsburg, D., & Pena, E. D. (2002). Understanding bilingualism and its impact on speech audiometry. *Journal of Speech, Language, and Hearing Research*, *45*, 202-213.

Ward, C. (2008). Thinking outside the Berry boxes: New perspectives on identity, acculturation and intercultural relations. *International Journal of Intercultural Relations, 32,* 105-114.

Williams, C. L., & Berry, J. W. (1991). Primary prevention of acculturative stress among refugees. *American Psychologist*, *46*(6), 632-641.

Winterowd, C., Montgomery, D., Stumblingbear, G., Harless, D., & Hicks, K. (2008). Development of the American Indian enculturation scale to assist counseling practice. *American Indian and Alaska Native Mental Health Research: The Journal of the National Center, 15*(2), 1-14.

Wood, J. M., Tataryn, D. J., & Gorsuch, R. L. (1996). Effects of under-and overextraction on principal axis factor analysis with varimax rotation. *Psychological Methods*, *1*, 354-365.

Yellowtail, T. (2007). Native Spirit: *The Sun Dance way.* M.O. Fitzgerald, (Ed.). Bloomington, IN: World Wisdom, Inc.

Yu, L. C. (1984). Acculturation and stress within Chinese American families. *Journal of Comparative Family Studies*, *15*(1), 77-94.

Zheng, X. & Berry, J. W. (1991). Psychological adaptation of Chinese Sojourners in Canada. *International Union of Psychological Science,* 451-469.

# APPENDICES

## Appendix A

### Demographic and Information Questionnaire

Please complete the following information as accurately as possible. All information is strictly confidential and anonymous. This form will not include your name, only a subject number and at no time will your name be used in the data collection process. This will ensure that you will not be linked to the information given. Please complete all applicable questions. Thank you.

1) What is your age **(in years)?** _____

2) What is your sex? **(please check <u>one</u>)**
_____Male
_____Female

3. What is your tribal affiliation?
_____
(Title of Tribal Nation or Reservation here. For example: CS&KT, Crow Nation, Blackfeet Nation, etc,.)

4. Are you enrolled? **(please check <u>one</u>)**
_____Yes **(If you checked Yes, please skip to Question # 6).**
_____No **(If you checked No, please answer Question #5).**

5. Are you a descendent? **(please check <u>one</u>)**
_____First generation descendent **(I am not enrolled, but one of my parents is enrolled.)**
_____Second generation descendent **(Neither me nor my parents are enrolled, but one of my grandparents is enrolled.)**
_____I know that I have native ancestry, but I'm not sure of my status, my parents' status, or my grandparents' status.

6. What year in school are you? **(please check <u>one</u>)**
_____Freshman
_____Sophomore
_____Junior
_____Senior
_____Master's Student
_____Doctoral Student

7. How many years have you lived <u>on</u> a reservation?_____

8. How many years have you lived <u>off</u> reservation?_____

## Appendix B

### Native American Acculturation Scale

(Garrett & Pichette, 2000 revised by Trahan and Swaney, 2004).

**Please select the ONE choice with which you identify in the space provided. Please only select ONE answer per question.**

**1. What language can you speak?**

__ Tribal language only
__ Mostly tribal language, some English
__ Tribal language and English about equally well (bilingual)
__ Mostly English, some tribal language
__ English only

**2. What language do you prefer?**

__ Tribal language only
__ Mostly tribal language, some English
__ Tribal language and English about equally well (bilingual)
__ Mostly English, some tribal language
__ English only

**3. What language do you understand?**

__ Tribal language only
__ Mostly tribal language, some English
__ Tribal language and English about equally well (bilingual)
__ Mostly English, some tribal language
__ English only

**4. How do you identify yourself?**

__ Native American
__ Native American and some non-Native American (e.g., White, African American, Latino, or Asian American)
__ Native American and non-Native American (bi-cultural)
__ Non-Native American and some Native American
__ Non-Native American (e.g., White, African American, Latino, and Asian American)

**5. Which identification does (did) your mother use?**

__ Native American
__ Native American and some non-Native American (e.g., White, African American, Latino, etc.)
__ Native American and non-Native American (bi-cultural)
__ Non-Native American and some Native American
__ Non-Native American (e.g., White, African American, Latino, and Asian American)

**6. Which identification does (did) your father use?**

__ Native American
__ Native American and some non-Native American (e.g., White, African, American, Latino, etc.)
__ Native American and non-Native American (bi-cultural)
__ Non-Native American and some Native American
__ Non-Native American (e.g., White, African American, Latino, and Asian American)

**7. What was the ethnic origin of friends you had as a child up to age 6?**

__ Only Native American
__ Mostly Native Americans
__ About equally Native Americans and non-Native Americans
__ Mostly non-Native Americans (e.g., White, African Americans, Latinos, and Asian Americans)
__ Only non-Native Americans

**8. What was the ethnic origin of friends you had as a child 6-18?**

__ Only Native American
__ Mostly Native Americans
__ About equally Native Americans and non-Native Americans
__ Mostly non-Native Americans (e.g., White, African Americans, Latinos, and Asian Americans)
__ Only non-Native Americans

**9. Who do you associate with now in your community?**

__ Only Native American
__ Mostly Native Americans
__ About equally Native Americans and non-Native Americans
__ Mostly non-Native Americans (e.g., White, African Americans, Latinos, and Asian Americans)
__ Only non-Native Americans

**10. What music do you prefer?**

__ Native American music only (e.g., pow-wow music, traditional flute, contemporary, and chant)
__ Mostly Native American music
__ Equally Native American and other music
__ Mostly other music (e.g., rock, pop, country, rap, metal, classical, and opera)
__ Other music only

**11. What movies do you prefer?**

__ Native American movies only
__ Mostly Native American movies
__ Equally Native American and other movies
__ Mostly other movies
__ Other movies only

**12. Where were you born?**

__ Reservation, Native American community
__ Rural area, Native American community
__ Urban area, Native American community
__ Urban or Rural area, near Native American community
__ Urban or Rural area, away from Native American community

**13. Where were you raised?**

__ Reservation, Native American community
__ Rural area, Native American community
__ Urban area, Native American community
__ Urban or Rural area, near Native American community
__ Urban or Rural area, away from Native American community

**14. What contact have you had with Native American communities?**

__ Raised for 1 year or more on the reservation or other Native American community
__ Raised for 1 year or less on the reservation or other Native American community
__ Occasional visits to the reservation or other Native American community
__ Occasional communications with people on reservation or other Native American community
__ No exposure or communications with people on reservation or other Native American community

**15. What foods do you prefer?**

__ Native American food only
__ Mostly Native American foods and some other foods
__ About equally Native American foods and other foods
__ Mostly other foods
__ Other foods only

**16. In what language do you think?**

__ Tribal language only
__ Mostly Tribal language, some English
__ Tribal language and English about equally well (bilingual)
__ Mostly English, some Tribal language
__ English only

**17. Do you . . .**

__ Read only your Tribal language
__ Read a Tribal language better than English
__ Read both a Tribal language and English about equally well
__ Read English better than a Tribal language
__ Read only English

**18. Do you . . .**

__ Write only your Tribal language
__ Write a Tribal language better than English
__ Write both a Tribal language and English about equally well
__ Write English better than a tribal language
__ Write only English

**19. How much pride do you have in Native American culture and Heritage?**

__ Extremely proud
__ Moderately proud
__ A little proud
__ No pride, but do not feel negative toward other Native Americans
__ No pride, but do feel negative toward other Native Americans

**20. How would you rate yourself?**

__ Very Native American
__ Mostly Native American
__ Bicultural
__ Mostly non-Native American
__ Very non-Native American

**21. Do you participate in Native American traditions, ceremonies, occasions, and so on.**

__ All of them
__ Most of them
__ Some of them
__ A few of them
__ None at all

## Appendix C

### Social, Attitudinal, Familial, and Environmental (S.A.F.E.) Acculturative Stress Scale

(Mena, Padilla, and Maldonaldo, 1987)

Please answer the following items if you have experienced them at any time since attending the University. Please check only **one** response that most reflected the way that you felt at the time of the occurrence(s).

**1. I felt uncomfortable when others put down people of my ethnic background.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**2. I had more things blocking my success than most people.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**3. It bothered me that family members I was close to did not understand my different values.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**4. Close family members and I had conflicting expectations about my future.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**5. It was hard to express to my friends how I really feel.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**6. My family did not want me to move away but I wanted to.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**7. It bothered me to think that so many people used drugs.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**8. It bothered me that I could not be with my family.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**9. In looking for a good job, I sometimes felt that my ethnicity was a limitation.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**10. I didn't have many close friends.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**11. Many people had stereotypes about my culture or ethnic group and treated me as if they were true.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**12. I didn't feel at home.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**13. People thought I was unsociable when in fact I had trouble talking in English.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**14. I often felt that people were actively trying to stop me from advancing.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**15. It bothered me when people from a different culture pressured me to be like them.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**16. I often felt ignored by people who were supposed to assist me.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**17. Because I was different I did not get enough credit for the work that I did.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**18. Loosening the ties with my village / tribal community was difficult.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**19. I often thought about my cultural background.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**20. Because of my ethnic background, I felt that others often did not ask me to take part in their activities.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**21. People looked down upon me if I practiced the customs of my culture.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**22. I had trouble understanding others when they spoke.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**23. It bothers me that I have an accent.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

**24. It is difficult for me to "show off" to my family.**

_____Not applicable
_____Not stressful
_____A little stressful
_____Moderately stressful
_____Very stressful
_____Extremely stressful

---

## Appendix D

Survey Recruitment Letter

Hello. My name is Michael Trahan and I am an enrolled member of the Confederated Salish and Kootenai Tribes, an Indians Into Psychology (InPsych) Scholar, and a graduate student in the Clinical Psychology Program at The University of Montana. I am conducting a dissertation study testing the validity and reliability of an acculturation measure for American Indians/Native Americans, as well as the validity and reliability of an acculturation stress measure with American Indians/Native Americans, ages 18 and over. I am supervised on this project by Dr. Gyda Swaney from the Psychology Department at The University of Montana.

I write asking for your participation in my dissertation study. If you choose to participate, you will be asked to complete three instruments: a demographic information form, a survey which will ask you questions pertaining to how you identify yourself culturally, and a survey that asks about information pertaining to the levels of stress you may have incurred in the way you identify yourself culturally. In all, the demographic information and the two surveys should take approximately 20 minutes to complete.

The study is conducted on a secure, encrypted online survey site (surveymonkey.com) and at no time will you be asked to provide your name or telephone number. You will, however, be asked to provide an e-mail address if you wish to enter a drawing for one (1) of six (6) $25 Visa Gift Cards. The e-mail page that you submit for the drawing will not be linked to the data, to protect your confidentiality. After the six (6) winners have been notified, your e-mail address will not be retained.

If you would like to participate in this survey, please click on the link to the survey below.

https://www.surveymonkey.com/s/6FJV7K2 (link is now closed)

Your participation is completely voluntary and you may choose to skip any question and you may choose to discontinue the survey at any time. Should you choose to discontinue the survey, you may still enter your primary e-mail address for an entry to win one (1) of six (6) $25 Visa Gift Cards.

Thank you for considering participating in my study.

Michael B. Trahan, M.A. *(Confederated Salish & Kootenai Tribe)*
InPsych Scholar, Department of Psychology
The University of Montana, Missoula

Table 1

*Original Factor Structure of the N.A.A.S. by Garrett and Pichette (2000)*

---

*Factor 1 — Language*

1) What language can you speak?
2) What language do you prefer?
3) What language do you understand?
16) In what language do you think?

*Factor 2 — Identity*

4) How do you identify yourself?
5) Which identification does (did) your mother use?
6) Which identification does (did) your father use?
20) How would you rate yourself?

*Factor 3 — Friendships*

7) What was the ethnic origin of friends you had as a child up to age 6?
8) What was the ethnic origin of friends you had as a child up to age 6 to 18?
9) Who do you associate now in your community?

*Factor 4 — Behaviors*

10) What music do you prefer?
11) What movies do you prefer?
14) What contact have you had with Native American communities?
17) Do you…(read language)
18) Do you…(write language)
21) Do you participate in Native American traditions, ceremonies, occasions, and so on?

*Factor 5 — Generational/Geographical Backgrounds*

12) Where were you born?
13) Where were you raised?

*Factor 6 — Attitudes*

15) What foods do you prefer?
19) How much pride do you have in Native American culture and Heritage?

Table 2

*Original Factor Structure of the S.A.F.E. Found by Mena et al. (1987)*

---

*Factor 1 — Social*

10) I didn't have many close friends
12) I didn't feel at home
13) People thought I was unsociable when in fact, I had trouble talking in English.
23) It bothers me that I have an accent.

*Factor 2 — Attitudinal*

8) It bothered me that I could not be with my family.
18) Loosening the ties with my village/ Tribal community was difficult.
19) I often thought about my cultural background.
24) It is difficult for me to "show off" to my family.

*Factor 3 — Familial*

3) It bothered me that family members I was close to did not understand my different values.
4) Close family members and I had conflicting expectations about my future.
6) My family did not want me to move away but I wanted to.

*Factor 4 — Environmental*

1) I felt uncomfortable when others put down people of my ethnic background.
2) I had more things blocking my success than most people.
5) It was hard to express to my friends how I really feel.
7) It bothered me to think that so many people used drugs.

*Factor 4 — Environmental (continued)*

9) In looking for a good job, I sometimes felt that my ethnicity was a limitation.
11) Many people had stereotypes about my culture or ethnic group and treated me as if they were true.
14) I often felt that people were actively trying to stop me from advancing.
15) It bothered me when people from a different culture pressured me to be like them.
16) I often felt ignored by people who were supposed to assist me.
17) Because I was different I did not get enough credit for the work that I did.
20) Because of my ethnic background, I felt that others often did not ask me to take part in their activities.
21) People looked down upon me if I practiced the customs of my culture.

Table 3

*Means, Standard Deviations, Ranges, and Median Scores for the N.A.A.S. and S.A.F.E. scales (N = 100)*

| | *M* | *(SD)* | *Range* | *Median* |
|---|---|---|---|---|
| Age | 29.0 | (8.7) | 18 – 61 | 27.0 |
| Years on reservation | 12.9 | (11.0) | 0 – 43 | 13.5 |
| Years off reservation | 16.0 | (12.2) | 0 – 50 | 14.5 |
| N.A.A.S. | 65.1 | (10.9) | 36 – 87 | 64.0 |
| S.A.F.E. | 63.7 | (21.8) | 0 – 120 | 61.0 |

*Note:* N.A.A.S. = Native American Acculturation Scale, Garrett and Pichette (2000); S.A.F.E. = Social, Attitudinal, Familial, and Environmental Acculturation Stress Scale, Mena, Padilla, & Maldonaldo (1987)

Table 4

*Alpha Coefficients for Native American Acculturation Scale (N.A.A.S.) by Garrett and Pichette (2000) and Trahan (2007, 2011)*

| *Investigator(s)* | *N* | *α* |
|---|---|---|
| Garrett & Pichette (2000) | 139 Hispanic high school students | .91 |
| Trahan (2007) | 41 American Indian college students | .89 |
| Trahan (2001) | 100 American Indian college students | .87 |

Table 5

*Overall Fit Trend Statistics for Native American Acculturation Scale (N.A.A.S.) Using Exploratory Factory Analyses with Promax Rotation (N=100)by Trahan (2011).*

| *Measures of fit* | *N.A.A.S.* | *p-Value* |
|---|---|---|
| Degrees of Freedom *(df)* | 115 | |
| Goodness of Fit Index *($\chi^2$)* | 185.66 | .000 |

*Note: df = Degrees of Freedom; $\chi^2$ = Goodness of Fit Index from Statistical Package for the Social Sciences (SPSS)*

Table 6

*Factor Structure of the Native American Acculturation Scale from Exploratory Factor Analysis with Promax Rotation (N = 100) by Trahan (2011).*

| *Item* | *Factor* | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| *Factor 1 – Language* | | | | | |
| 2) What language do you prefer? | **.61** | **.42** | .19 | **.57** | .38 |
| 10) What music do you prefer? | **.83** | **.49** | -.02 | .39 | .14 |
| 11) What movies do you prefer? | **.59** | .39 | -.07 | .23 | .06 |
| 15) What foods do you prefer? | **.65** | .38 | -.09 | .17 | .08 |
| 19) How much pride do you have in Native American culture and heritage? | **.45** | .17 | .10 | .25 | .07 |
| 21) Do you participate in Native American traditions, ceremonies, occasions, and so on? | **.81** | **.58** | .22 | **.60** | .27 |
| *Factor 2 — Identity* | | | | | |
| 1) What language can you speak? | **.48** | **.69** | .31 | **.58** | .30 |
| 3) What language do you understand? | **.58** | **.65** | .32 | **.57** | **.40** |
| 16) In what language do you think? | **.66** | **.70** | .16 | **.40** | .18 |
| 17) Do you…(read language) | **.47** | **.95** | .24 | **.41** | .25 |
| 18) Do you…(write language) | **.59** | **.91** | .24 | .34 | .25 |
| *Factor 3 — Friendships* | | | | | |
| 7) What was the ethnic origin of friends you had as a child up to age 6? | -.02 | .24 | **.73** | .35 | .26 |
| 8) What was the ethnic origin of friends you had as a child up to age 6 to 18? | .22 | .33 | **.74** | **.51** | .19 |

Table 6 (continued)

*Factor Structure of the Native American Acculturation Scale from Exploratory Factor Analysis with Promax Rotation (N = 100) by Trahan (2011).*

| *Item* | *Factor* | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| *Factor 3 — Friendships (continued)* | | | | | |
| 12) Where were you born? | -.18 | .15 | **.60** | .19 | .21 |
| 13) Where were you raised? | .04 | .18 | **.87** | .30 | .21 |
| 14) What contact have you had with Native American communities? | .19 | .21 | **.60** | .35 | .11 |
| *Factor 4 – Behaviors* | | | | | |
| 4) How do you identify yourself? | .35 | .37 | .24 | **.65** | **.52** |
| 5) Which identification does (did) your mother use? | .13 | .14 | .34 | **.64** | -.17 |
| 9) Who do you associate now in your community? | .39 | .30 | .23 | **.56** | .11 |
| 20) How would you rate yourself? | **.63** | **.46** | .23 | **.66** | **.41** |
| *Factor 5 — Generational/Geographical Backgrounds* | | | | | |
| 6) Which identification does (did) your father use? | .04 | .15 | .34 | .11 | **.97** |
| *Factor 6 — Attitudes* | | | | | |
| No items loaded into this factor | | | | | |
| *Cronbach's alpha* | 0.84 | | | | |
| *Eigenvalue* | 6.82 | 3.09 | 1.61 | 1.45 | 1.17 |
| *Variance explained (%)* | 32.5 | 14.7 | 7.7 | 6.9 | 5.6 |

*Note: Item loadings >.40 are in **bold***

Table 7

*Communalities and Classification of Communalities, Based from MacCallum et al. (1999) of the Native American Acculturation Scale (N.A.A.S.) by Trahan (2011).*

| *Item* | *Communalities* | *Classification* |
|---|---|---|
| item 1 | **.69** | **High** |
| item 2 | .58 | Moderate |
| item 3 | **.70** | **High** |
| item 4 | .57 | Moderate |
| item 5 | **.60** | **High** |
| item 6 | **.60** | **High** |
| item 7 | **.62** | **High** |
| item 8 | **.66** | **High** |
| item 9 | .44 | Low |
| item 10 | **.63** | **High** |
| item 11 | .53 | Moderate |
| item 12 | .52 | Moderate |
| item 13 | **.65** | **High** |
| item 14 | .42 | Low |
| item 15 | .59 | Moderate |
| item 16 | **.65** | **High** |
| item 17 | **.84** | **High** |
| item 18 | **.86** | **High** |
| item 19 | .43 | Low |
| item 20 | **.64** | **High** |
| item 21 | **.70** | **High** |

*Note: Communalities ≥ .60 are in* ***bold***

Table 8

*Overall Fit Trend Statistics for Social, Attitudinal, Familial, and Environmental Acculturation Stress Scale (S.A.F.E.) Exploratory Factory Analyses with Promax Rotation (N=100) by Trahan (2011).*

| *Measures of fit* | *S.A.F.E.* | *p-Value* |
|---|---|---|
| Degrees of Freedom *(df)* | 147 | |
| Goodness of Fit Index *($\chi^2$)* | 175.10 | .057 |

*Note: df = Degrees of Freedom*; *$\chi^2$ = Goodness of Fit Index from Statistical Package for the Social Sciences (SPSS)*

Table 9

*Alpha Coefficients for the Social, Attitudinal, Familial, and Environmental Acculturation Stress Scale (S.A.F.E.) by Mena, Padilla, and Maldonaldo (1987), and Trahan (2007, 2011)*

| *Investigator(s)* | *N* | *α* |
|---|---|---|
| Mena, Padilla, & Maldonaldo (1987) | 214 Hispanic college students | .86 |
| Trahan (2007) | 41 A.I. college students | .90 |
| Trahan (2011) | 100 A.I. undergrad and grad students | .91 |

Table 10

*Factor Structure of the S.A.F.E. Using Exploratory Factor Analysis with Promax Rotation (N = 100) by Trahan (2011)*

| *Item* | *Factor* | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| *Factor 1 – Social Stressors* | | | | | | |
| 14) I often felt that people were actively trying to stop me from advancing. | **.81** | .39 | **.64** | .16 | .23 | -.49 |
| 16) I often felt ignored by people who were supposed to assist me. | **.73** | .41 | **.64** | .27 | .28 | -.25 |
| 17) Because I was different I did not get enough credit for the work that I did. | **.73** | .35 | **.49** | .28 | .17 | -.34 |
| 20) Because of my ethnic background, I felt that others often did not ask me to take part in their activities. | **.76** | .37 | **.52** | **.43** | .26 | -.05 |
| 21) People looked down upon me if I practiced the customs of my culture. | **.66** | **.42** | **.47** | **.51** | .29 | -.23 |
| *Factor 2 – Attitudinal Stressors* | | | | | | |
| 4) Close family members and I had conflicting expectations about my future. | .34 | **.61** | .39 | **.57** | .28 | -.51 |
| 8) It bothered me that I could not be with my family. | .20 | **.73** | **.49** | **.48** | .33 | -.20 |
| 12) I didn't feel at home. | .37 | **.69** | **.62** | **.53** | .34 | -.21 |
| 18) Loosening the ties with my Village/ Tribal community was difficult. | .39 | **.89** | .39 | .39 | **.42** | -.12 |
| 19) I often thought about my cultural background. | .31 | **.67** | **.42** | **.43** | .29 | -.14 |

*Note: Item loadings >.40 are in **bold***

Table 10 (continued)

*Factor Structure of the S.A.F.E. Using Exploratory Factor Analysis with Promax Rotation (N = 100) by Trahan (2011)*

| *Item* | *Factor* | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| *Factor 3 – Familial Stressors* | | | | | | |
| 1) I felt uncomfortable when others put down people of my ethnic background. | .38 | .29 | **.58** | .36 | .06 | -.15 |
| 2) I had more things blocking my success than most people. | **.47** | **.48** | **.69** | **.42** | .22 | -.35 |
| 3) It bothered me that family members I was close to did not understand my different values. | .39 | **.48** | **.64** | **.62** | .23 | -.76 |
| 9) In looking for a good job, I sometimes felt that my ethnicity was a limitation. | **.42** | .26 | **.61** | .21 | .31 | -.07 |
| 11) Many people had stereotypes about my culture or ethnic group and treated me as if they were true. | **.55** | **.40** | **.65** | .36 | .15 | -.31 |
| 15) It bothered me when people from a different culture pressured me to be like them. | **.56** | **.55** | **.69** | .22 | .20 | -.22 |
| *Factor 4 – Environmental Stressors* | | | | | | |
| 5) It was hard to express to my friends how I really feel. | **.51** | **.42** | **.55** | **.69** | .10 | -.33 |
| 6) My family did not want me to move away but I wanted to. | .10 | **.47** | .26 | **.54** | .34 | -.25 |
| 10) I didn't have many close friends. | .39 | **.47** | **.49** | **.55** | .31 | -.20 |
| 24) It is difficult for me to "show off" to my family. | .11 | .29 | .20 | **.49** | .20 | .21 |

*Note: Item loadings >.40 are in **bold***

Table 10 (continued)

*Factor Structure of the S.A.F.E. Using Exploratory Factor Analysis with Promax Rotation (N = 100) by Trahan (2011)*

| *Item* | *Factor* | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| *Factor 5 – New factor found in analysis* | | | | | | |
| 13) People thought I was unsociable when in fact, I had trouble talking in English. | .29 | .33 | .28 | .35 | **.72** | -.22 |
| 22) I had trouble understanding others when they spoke. | **.45** | .38 | .29 | .22 | **.70** | -.20 |
| 23) It bothers me that I have an accent. | -.03 | **.41** | .21 | .15 | **.76** | .21 |
| *Item that did not load into any factor* | | | | | | |
| 7) It bothered me to think that so many people used drugs. | .08 | .22 | .18 | .17 | .13 | .27 |
| *Cronbach's alpha* | 0.91 | | | | | |
| *Eigenvalue* | 8.38 | 2.34 | 1.56 | 1.36 | 1.18 | 1.05 |
| *Variance explained (%)* | 34.91 | 9.74 | 6.50 | 5.65 | 4.91 | 4.37 |

*Note: items that load >.40 are in **bold***

Table 11

*Communalities and Classification of Communalities, Based from MacCallum et al. (1999) of the Social, Attitudinal, Familial, and Environmental Acculturation Stress Scale (S.A.F.E.) by Trahan (2011)*

| *Item* | *Communalities* | *Classification* |
|---|---|---|
| Item 1 | .49 | Low |
| Item 2 | .57 | Moderate |
| Item 3 | **.62** | **High** |
| Item 4 | .57 | Moderate |
| Item 5 | **.67** | **High** |
| Item 6 | .50 | Moderate |
| Item 7 | .29 | Low |
| Item 8 | **.60** | **High** |
| Item 9 | .46 | Low |
| Item 10 | .56 | Moderate |
| Item 11 | **.60** | **High** |
| Item 12 | **.70** | **High** |
| Item 13 | .53 | Moderate |
| Item 14 | **.73** | **High** |
| Item 15 | .57 | Moderate |
| Item 16 | **.66** | **High** |
| Item 17 | **.62** | **High** |
| Item 18 | **.67** | **High** |
| Item 19 | .52 | Moderate |
| Item 20 | **.65** | **High** |
| Item 21 | **.63** | **High** |
| Item 22 | **.61** | **High** |
| Item 23 | .56 | Moderate |
| Item 24 | .43 | Low |

*Figure 1*

Scree Plot for Native American Acculturation Scale (N.A.A.S.) by Trahan (2011)

---

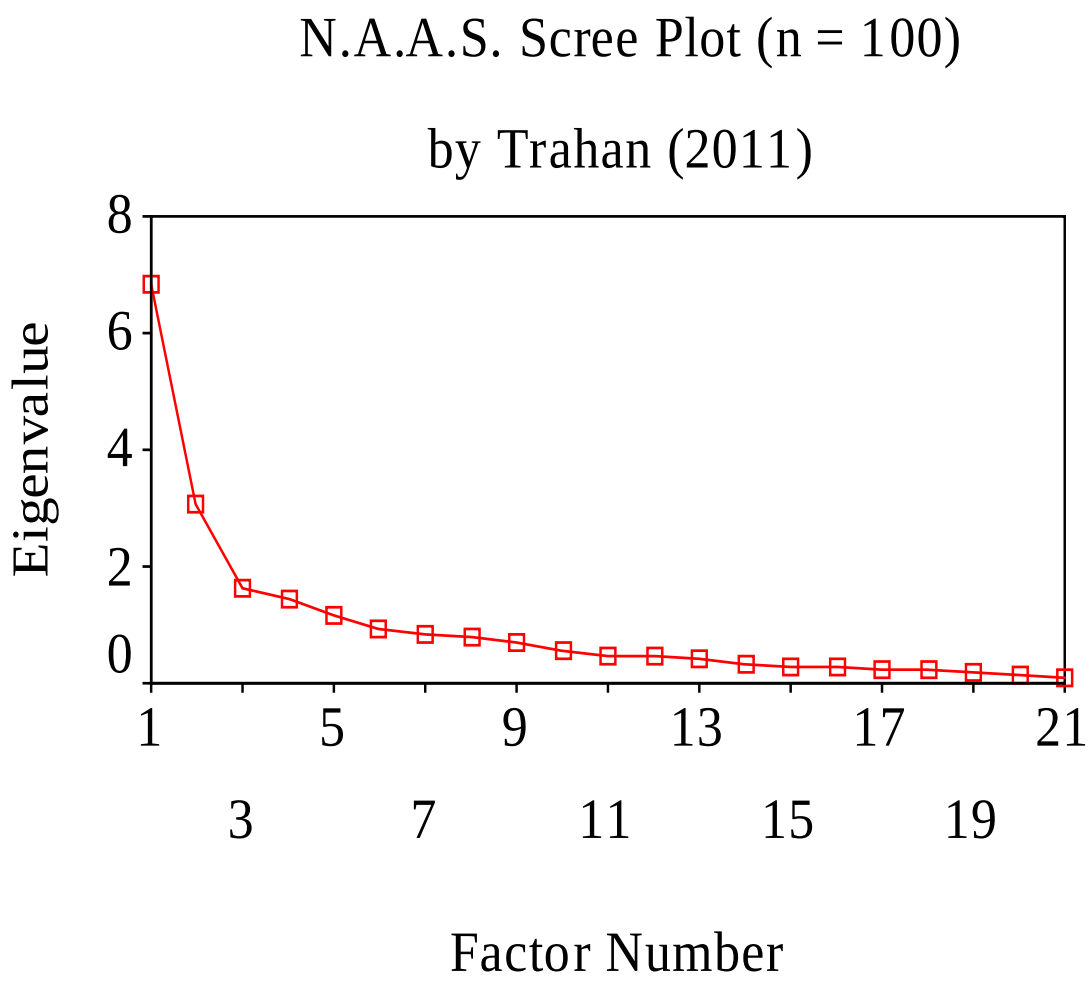
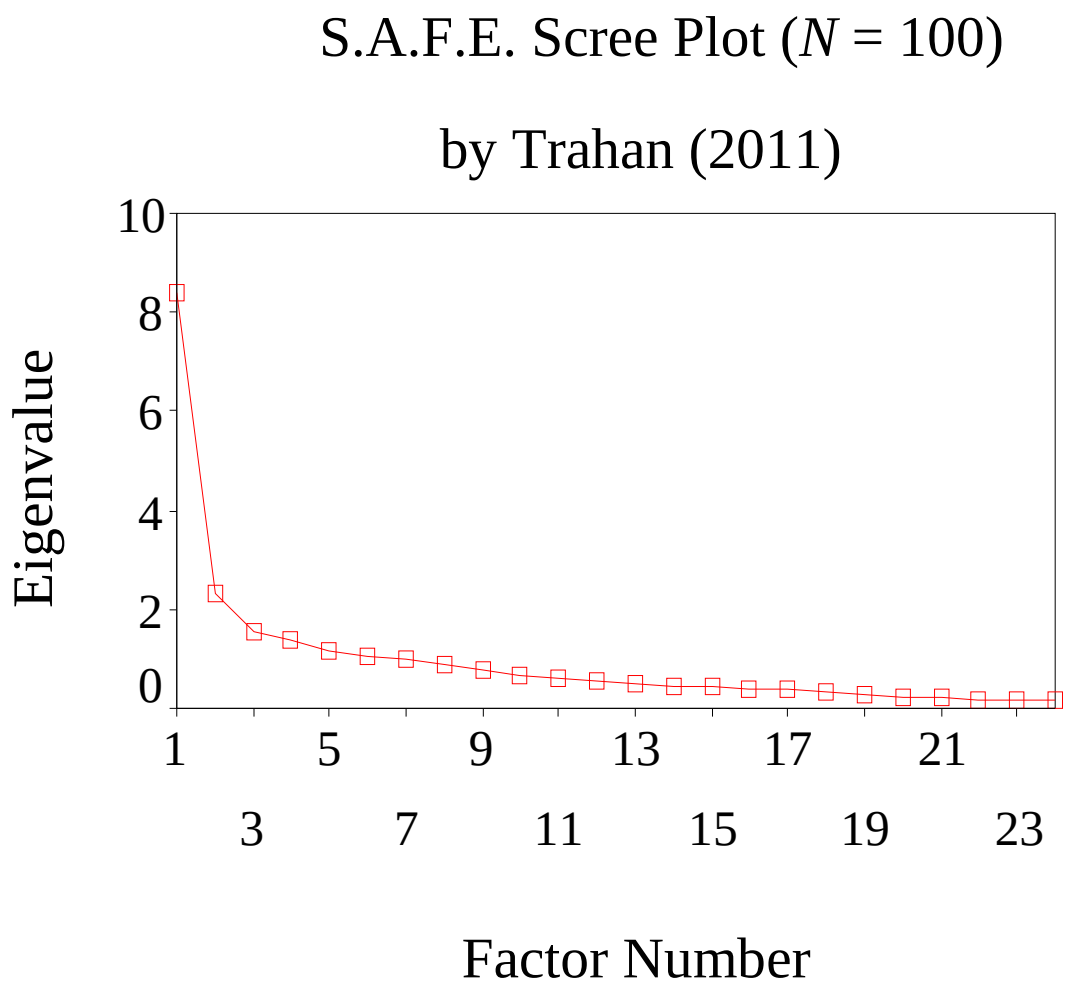


*Figure 2*

Scree Plot for Social, Attitudinal, Familial, and Environmental Stress Scale (S.A.F.E.) by Trahan (2011)

---




.